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Put Appropriations on Sane Basis

**Necessary Improvements to Rivers and Harbors Will
Require Vast Sum Which Must Be Expended Effectively**

AMERICAN government is notoriously profligate and among the numerous interesting methods that we have devised for squandering money wholesale, our biennial appropriations for rivers and harbors have become a marvel even in a land where pension jobbery and public buildings grafting have been developed to the highest state of perfection. The high tide of spoliation, however, is ebbing, and there are unmistakable signs that we are awakening to the necessity of moderate economy in managing the national exchequer. In this respect we are showing a commendable spirit, but being an enthusiastic people, we are wont to carry our reforms far beyond the point of reason. There is danger that such may be the case in authorizing expenditures for the improvement of our internal waterways. In the exercise of economy we should not become parsimonious.

In recent years our rivers and harbors bills have offered shining marks for the champions of public thrift, who have not hesitated to point out all of their manifold weaknesses. We have learned of expenditures of millions on waterways where the traffic should be reckoned by hatfuls; we have been told of projects to improve creeks so puny as to be scorned even by minnows and we have heard so much of pork that many of our citizens have concluded that all federal expenditures for waterways are tainted with lard.

Legitimate Improvements in Danger

We face a situation, therefore, where legitimate and sorely needed river and harbor improvements may be thrown into the discard or indefinitely postponed to the detriment of our commerce, because of popular clamor regarding the character of certain appropriations in the past. Here lies a danger which the maritime and navigation interests of the United States should take steps to avert.

The time has not yet come when we can avoid

making large expenditures for the improvement of internal waterways, if our business life is to continue to flourish. In spite of enormous expenditures, our rivers, harbors, ports and canals, as a whole, are inadequately developed and insufficiently equipped. Compared with Europe, particularly Germany, we are 25 years behind the times. But little effort has been made to keep pace with the growth in the size and carrying capacity of steamships or to provide facilities for their rapid dispatch.

Economy Vs. Effectiveness

Economy is not so much needed in river and harbor expenditures as *effectiveness*. We want waterways that will be used, channels straightened where the traffic is sufficiently heavy to justify the expense, and harbors deepened only if commerce will follow the dredger. Our municipalities and states also have much to do in providing economical means of handling and transferring freight. The expenditure of large sums is demanded, but the work must be so administered that there will be something to show for the money—something more tangible and enduring than receipted vouchers.

The lump sum method of appropriation forced on the last congress by Senator Burton is therefore to be commended and should be endorsed by all who have the welfare of our navigating interests at heart. It represents a long step forward, since it transfers the responsibility from an unbridled, log-rolling, badly advised committee, to a corps of expert engineers who are guided by facts and are not worried over the necessity for being re-elected.

Given adequate funds in a lump sum, the United States Engineers may be entrusted to get results and to eliminate the pig-sty odor from at least one branch of national expenditure.

Great Lakes Waterways Conference

Important Resolutions Passed at Second Annual Meeting in Detroit—Plans Perfected for the Ensuing Year

By H. Cole Estep

ACHIEVEMENT was written large in the proceedings of the second annual Great Lakes Waterways Conference at Detroit, Oct. 28 and 29. Many vital problems connected with the development of lake commerce were considered and the general subjects of port development and the improvement of internal waterways were discussed by eminent speakers. A number of important recommendations were embodied in the formal resolutions adopted at the close of the meeting. It was the sense of the conference that certain sections of the seamen's law, which are deemed injurious to navigation interests on the Great Lakes, should be amended or repealed, and the resolutions provided for appropriate action along this line, including the presentation of a petition to congress. It was also decided, informally, to send a committee representing the conference to Washington at the proper time to urge the necessary changes in the seamen's act. The resolutions also recommended that the various Great Lakes cities appoint non-partisan, non-political harbor commissions for the purpose of fostering the development of Great Lakes ports. In addition, the regulations recommended the early completion of the New York state barge canal owing to its great influence on freight rates and the growth of commerce between the east and the west. Appropriate action also was taken looking toward petitioning the next speaker of the house of representatives to provide the Great Lakes with adequate representation on the rivers and harbors committee.

Detroit Welcomes Delegates

The conference opened Thursday morning, Oct 28, with a large number of influential men connected with lake transportation interests in attendance. An address of welcome was made by Charles B. Warren, president of the Detroit board of commerce. In the course of his remarks Mr. Warren touched on the plans of Detroit citizens to further develop the iron and steel industry in their district, involving important harbor improvements and considerable port development for handling iron ore and other cargoes.

At the present time the receipts of iron ore in Detroit are very light compared with other lower lake ports.

A. A. Templeton, Detroit Seamless Steel Tubes Co., Detroit, president of the conference, responded to the address of welcome. Mr. Templeton briefly traced the growth of lake commerce and also outlined the history of the Great Lakes Waterways Conference which was organized in 1914 for the purpose of promoting commerce and port development on the Great Lakes. He emphasized the necessity for co-operation among Great Lakes ports, pointing out that their interests are mutual and that the problems confronting the commerce of the lakes can be solved satisfactorily only through united action. The Great Lakes, he said, constitute the United States' greatest natural asset.

The principal address at the Thursday morning session was made by Harvey D. Goulder, of Goulder, White & Garry, attorneys, Cleveland, on "The Importance and Influence of Lake Commerce". Mr. Goulder's position as legal representative of the Lake Carriers' Association lent unusual weight and interest to his remarks. He pointed out that commerce, which is the basis of all life and industry, depends upon transportation. He traced the development of navigation on the Great Lakes in some detail, pointing out that the ton-miles of freight carried on the lakes during the eight months' season of navigation was equal to 30 per cent of the freight tonnage handled by all the railroads of the United States. Most of the Great Lakes tonnage, he also pointed out, originates and terminates on railroads. The water rate is only 0.6 of a mill per ton-mile as contrasted with an average rail rate of from three to seven mills. He stated that over \$200,000,000 is invested in ships on the Great Lakes and pointed out how improvements during the past 25 years have reduced the gross earnings per ton carried from \$1.09 to 69 cents. In a graphic manner he portrayed the influence of lake commerce on the cost of living in the United States, pointing out clearly that the cheap transportation available on the Great Lakes is of benefit to the whole country and a boon to

communities located at distant inland points.

The delegates and guests at the conference were entertained at luncheon on Thursday by the Detroit board of commerce. Charles B. Warren presided. The principal address was delivered by Ernest M. Loeb, president of the board of commissioners of the port of New Orleans, who covered the operations of the great Mississippi river port in a thorough and comprehensive manner. Mr. Loeb's paper, which is published elsewhere in this issue, deals with the history of port development in New Orleans, with the financing of port improvements, with the fixing of proper port charges and dues, with the organization and administration of the port's affairs and with the details of the harbor facilities at New Orleans, including wharves, warehouses, elevators, belt railroad, etc. In particular he pointed out the necessity for balancing the trade of a port, providing imports and exports as nearly as possible in equal volume.

River and Harbor Pork

Charles B. Smith, member of congress from Buffalo, discussed federal expenditures for ports and waterways. He stated that vital and necessary harbor improvements in the United States may suffer from the general public feeling against river and harbor appropriations, arising from the wasteful and profligate manner in which these expenditures have been made in the past. Quoting from official records he gave many interesting details regarding certain appropriations for the improvement of rivers, on which commerce was conspicuous by its absence. In this connection he pointed out that \$4,550,000 had been spent by the government on the Trinity river in Texas, on which 27,000 tons of freight moves annually. He stated that \$65,000 already had been appropriated for the Suwanee river, possibly for sentimental reasons, inasmuch as the annual freight traffic on this stream is less than 15,000 tons. The Clearwater river in Florida, he stated, had been dredged from a depth of 0.5 of a foot to 4.5 feet at a cost of \$60,000, resulting in an annual freight traffic of 3,500 tons. Congressman

Smith pointed out that while expenditures of this character are being made, necessary improvements to the Great Lakes and the sounds, bays and harbors of both coasts, where the annual freight movement reaches millions of tons, are neglected. He expressed himself as favoring the lump sum method of appropriation, making the United States engineers responsible for the proper apportionment of the expenditure.

The third session, Thursday afternoon, was opened by a paper by William George Bruce, president of the Milwaukee harbor commission, entitled "Lake Ports and Their Problems." Mr. Bruce's paper, which is published elsewhere in this issue, contains deductions drawn from a series of questions sent to 20 important cities on the Great Lakes. Mr. Bruce pointed out that the inner harbors at most of the lake cities are out of date and that there is an urgent demand for improvements which will bring port development in harmony with the increase in the carrying capacity of lake steamers during the past few years.

Considerable time was given on Thursday afternoon to an informal discussion of the extent to which the conference should interest itself in port problems. It was unanimously agreed that the development of individual ports was a proper subject for consideration by the conference and it was also pointed out that definite action was necessary to put the conference on a basis where it is of tangible benefit to the development of lake commerce. In this connection the necessity for a paid secretary who would devote his entire time to the work of the conference was discussed.

E. A. Niel, Rochester, N. Y., urged greater publicity for the Great Lakes, stating that the business people along the lakes should be educated to a greater appreciation of the importance and advantage of lake transportation. The report of the executive committee was read by the secretary,

R. C. O'Keefe, secretary of the Buffalo chamber of commerce.

The following committees were appointed at the Thursday afternoon session: *Finance* — A. J. Crockett, Rochester; John C. Davis, Milwaukee; P. J. Gagen, Sandusky. *Membership*—R. A. Downey, Oswego; Oliver Phelps, Detroit; F. C. Reynolds, Milwaukee. *Nominating* — George E. Pierce, Buffalo; A. T. Waterfall, Detroit; E. L. Strong, Ogdensburg, and *Resolutions*—William G. Bruce, Milwaukee; F. B. Shepherd, Oswego; E. A. Niel, Rochester.

Charles M. Heald, president of the

ever, that existing conditions in many cities make it very difficult to transform this ideal into a reality and in this connection he urged the development of an intelligent public opinion to deal with port problems.

An exceedingly interesting address on the effect of the seamen's act on the Great Lakes was delivered by C. B. DeWitt, attorney, Sandusky, O. He pointed out why the three-watch provision of the new law is considered burdensome on the lakes, particularly to steamers forced to make landings at out-of-the-way ports. The provisions of section 13 regarding

the certification of able seamen also place an unnecessary handicap on lake commerce, in the opinion of the speaker. In addition, he pointed out the great dissimilarity between conditions on the Great Lakes and on the high seas, stating that the same law could not be made applicable to both situations. The seamen's act, he said, originally was intended to cover salt water traffic only, the Great Lakes being included as an afterthought.

Mr. DeWitt's address was discussed extensively. One speaker described the difficulties of applying the three-

watch regulation to a 12-hour run between Ogdensburg, N. Y., and Charlotte, N. Y., particularly in view of the fact that the vessel lays over from eight to ten hours at each end of the trip, giving the crew ample time for rest and recreation.

At the final session Friday afternoon the finance committee brought forward a plan for placing the conference on a firm financial footing, providing it with funds adequate for the important work which it must undertake. The plan involves dues for organization members ranging from \$10 to \$100 per year, depending on the membership in the organization represented, together with individual memberships at \$10 per year, and sustaining memberships ranging upward from \$25. The appointment of a paid secretary to devote his whole time to the affairs of the con-

Roster of Delegates and Guests

Name.	Organization.	Address.
Herman Bleyer	Mil. Harbor Commission.....	Milwaukee, Wis.
P. S. Bond.....	Col. Corps of Engrs. U. S. A.	Cleveland, O.
Wm. George Bruce.....	Mil. Harbor Commission.....	447 Hanover St., Milwaukee, Wis.
C. N. Cramer.....	Pres., Dock and Harbor Bd....	Ashland, Wis.
A. J. Crockett.....	Rochester Ch. of Com.....	Rochester, N. Y.
James E. Davidson.....	Bay City Bd. of Commerce.....	Bay City, Mich.
C. B. DeWitt.....	Sandusky Federated Com'l Club	201 Frank Bldg., Sandusky, O.
John C. Davis.....	Harbor Commission	Milwaukee, Wis.
Robert A. Downey.....	Oswego Cham. of Com.....	Oswego, N. Y.
William H. Daniels.....	Chamber of Commerce.....	Ogdensburg, N. Y.
L. V. Frazier.....	Major, Corps of Engrs.....	Buffalo, N. Y.
H. Cole Estep.....	Man'g. Editor, Marine Review.	Cleveland, O.
H. B. Ferguson.....	Major, Corps of Engrs.....	Milwaukee, Wis.
P. J. Gagen.....	Commercial Club	Sandusky, O.
Harvey D. Goulder.....		Cleveland, O.
Byres H. Gitchell.....	Secy., Det. Bd. of Com.....	Detroit, Mich.
Chas. M. Heald.....	Pres. Mutual Transit Co.....	Buffalo, N. Y.
Ernest M. Loeb.....	Pres. Bd. of Comrs., Pt. of N. O.	New Orleans, La.
J. B. McMurrick.....	Chamber of Commerce.....	Oswego, N. Y.
E. A. Niel.....	Roch. Ch. of Commerce.....	Rochester, N. Y.
Richard O'Keefe.....	Buffalo Ch. of Commerce.....	Buffalo, N. Y.
Geo. E. Pierce.....	Buffalo Ch. of Commerce.....	Buffalo, N. Y.
E. D. Peek.....	Major, Corps of Engrs.....	Duluth, Minn.
D. W. Pell.....	Oswego Cham. of Com.....	Oswego, N. Y.
Oliver Phelps.....	Det. Bd. of Commerce.....	Detroit, Mich.
F. C. Reynolds.....	Chamber of Commerce.....	Milwaukee, Wis.
A. A. Schantz.....	D. & C. Navigation Co.....	Detroit, Mich.
F. B. Shepherd.....	Oswego Cham. of Com.....	Oswego, N. Y.
Charles B. Smith.....	Member of Congress.....	392 Porter Ave., Buffalo, N. Y.
Edward L. Strong.....	Chamber of Commerce.....	Ogdensburg, N. Y.
A. A. Templeton.....	Board of Commerce.....	Detroit, Mich.
A. R. Templeton.....	Chamber of Commerce.....	Milwaukee, Wis.
A. T. Waterfall.....	Detroit Board of Com.....	Detroit, Mich.
Frank E. Williamson.....	Buffalo Cham. of Com.....	Buffalo, N. Y.
C. B. Warren.....	Pres. Detroit Bd. of Com.....	Detroit, Mich.
J. G. Warren.....	Col. Corps of Engrs. U. S. A.	Buffalo, N. Y.

Mutual Transit Co., Buffalo, opened the Friday morning session with an exceedingly interesting paper entitled "Port Facilities for Loading and Unloading Freight". Mr. Heald's paper, which dealt largely with the development of terminal facilities for handling package freight, pointed out that railroad opposition to water transportation has practically disappeared. Railway managers, he stated, are no longer prejudiced against water transportation, realizing that the general commercial prosperity of the country, and the consequent development of its traffic, depends upon the full and proper use of all available avenues of transportation. Warehouse and dock property for handling package freight, he stated, should be centralized and provided with unobstructed connection to all railroads alike. Mr. Heald pointed out, how-

ference was unanimously recommended by the finance committee. The report of this committee was accepted and referred to the executive committee for action.

The membership committee recommended the appointment of a standing committee on membership to work with the secretary in enlarging the membership of the conference. An outline of the recommendations of the resolutions committee was given in the introduction of this report.

Election of Officers

The recommendations of the nominating committee were unanimously approved and the following officers were elected for the ensuing year: A. A. Templeton, Detroit, president; E. A. Niel, Rochester, first vice president; William George Bruce, Milwaukee, second vice president; H. C. Gardner, Chicago, treasurer; C. B. DeWitt, Sandusky, secretary. The executive committee will be constituted as follows: Robert A. Downey, Oswego, and J. C. Howard, Ogdensburg, for the Ontario district; Richard C. O'Keefe, Buffalo, and D. L. Tuttle, Buffalo, for the Erie district; Arthur T. Waterfall, Detroit, and W. G. Norvell, Detroit, for the Huron district; T. Edward Wilder, Chicago, and Herman Bleyer, Milwaukee, for the Michigan district; Charles F. MacDonald, Duluth, and Charles N. Cramer, Ashland, Wis., for the Superior district.

An exceedingly interesting account of the effect of the proposed deepening of the Hudson river was given on Friday afternoon by Frank E. Williamson, Buffalo. Mr. Williamson's paper is published in full elsewhere in this issue.

Richard C. O'Keefe, Buffalo, retiring secretary of the organization, outlined the status of work on the New York state barge canal, pointing out that the canal as a whole is now 90 per cent completed. The new canal will admit barges with a capacity of approximately 2,500 tons. It is interesting to compare this with the capacity of the old Erie canal boats which averaged 240 tons.

Launch Big Steamer

The steamship FLORIDA, built by the Maryland Steel Co. for the American-Hawaiian Steamship Co., was launched at Sparrows Point, Md., Oct. 16. The vessel has a carrying capacity of 10,000 tons and is guaranteed to make a speed of 12 knots. She is a duplicate of the steamship WASHINGTONIAN, sunk off Fenwick's Island in collision with the schooner ELIZABETH PALMER some time ago.

Henry B. Ford

Brief reference was made in the November issue of *The Marine Review* to the death of Henry B. Ford, western agent of the Erie Railroad Lake Line at Chicago on Sunday, Oct. 10. Mr. Ford was born in Springfield, Mass., Aug. 13, 1853. With his parents he went to Chicago in 1856 where he resided until the time of his death. After graduating from the public schools of Chicago he took a business course and then entered the employ of the State Savings Bank as paying teller. In 1878 he entered the service of the Erie railroad as assistant to the late Thomas T. Morford, general western agent of what was then the Union Steamboat Co.



HENRY B. FORD

Mr. Ford succeeded Mr. Morford as general western agent when the latter was promoted to the position of general manager of the Erie Lake Line.

Oakum Shortage

Owing to curtailment in the customary source of oakum supply, manufacturers in this country are combining the market for soft fibre tarred hemp rope. Among the various producers of oakum who are actively buying this material is the George Stratford Oakum Co., Jersey City, N. J. High prices are being paid for rope of suitable quality.

Southwark Foundry & Machine Co., Philadelphia, Pa., is represented in the west by Stewart Bolling, 1440 Old Colony building, Chicago, Ill.

Ore Shipments

Ore shipments during October were 7,146,873 tons, making the total movement to Nov. 1, 41,816,439 tons. During November of 1913, 3,270,958 tons were moved by the fleet, so that if it moves the same amount this year, the season's movement will exceed 45,000,000 tons. The fleet will unquestionably move more than that during the balance of the season, as the December movement in 1913 was only 1,411 tons, whereas there has already been lined up a considerable movement for December during the present year. It will therefore not be surprising if the total movement during the present year approximates 47,000,000 tons.

Following are the shipments by ports:

Port.	October, 1914.	October, 1915.
Escanaba	421,341	928,399
Marquette	265,861	522,671
Ashland	487,829	866,170
Superior	1,442,216	1,351,893
Duluth	918,144	2,301,352
Two Harbors	707,001	1,176,388
1915 increase	4,242,392	7,146,873
Port.	To Nov. 1, 1914.	To Nov. 1, 1915.
Escanaba	3,440,992	4,940,081
Marquette	1,651,579	2,836,203
Ashland	3,229,746	4,695,752
Superior	10,920,469	7,348,916
Duluth	6,197,043	14,108,571
Two Harbors	5,511,976	7,886,916
1915 increase	30,951,805	41,816,439
		10,864,634

Ore Receipts

Furnaces are taking ore freely from Lake Erie docks and the burden will not be great upon them by Dec. 1. While ore shipments to Nov. 1 were 10,864,634 tons greater than they were last year, the amount on dock Nov. 1 was scarcely more than it was last year. The ore has, in fact, been going into cars practically all season and very little of it has touched the docks at all. Receipts at the different Lake Erie ports during October were:

Port.	October, 1915.
Buffalo	834,114
Port Colborne	28,284
Erie	137,481
Conneaut	1,150,744
Ashtabula	1,187,847
Fairport	270,227
Cleveland	1,246,899
Lorain	429,115
Huron	108,632
Toledo	251,397
Detroit	96,436
	5,741,176

Orders Ships in China

For the first time in history, Chinese ship builders are competitors of the European yards. A steamship company of Drammen, Norway, has ordered three steamers in China, to be delivered in 1916 and 1917. The placing of this order in China is due to the unusual pressure on the home yards.

Auxiliary Schooner for South Seas

Details of New Three Master "Gilbert Islands" Equipped With Eighty Horsepower Bolinders Type Engine

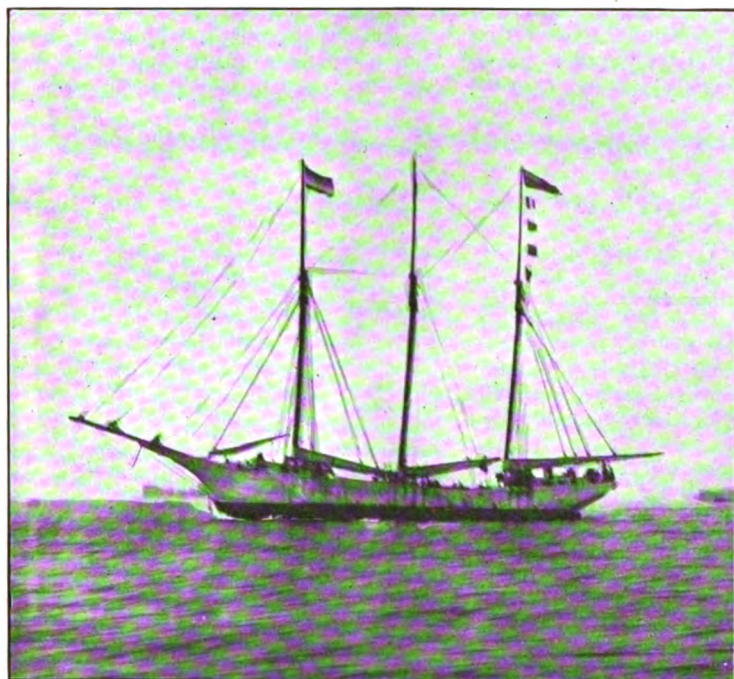
By E. C. Kreuzberg

GILBERT ISLANDS, an interesting vessel of the auxiliary type, which rapidly is being adopted by shipowners throughout the world, underwent a successful trial trip in New York harbor, on Oct. 28. She is schooner rigged and has an 80-brake-horsepower, two-cyl-

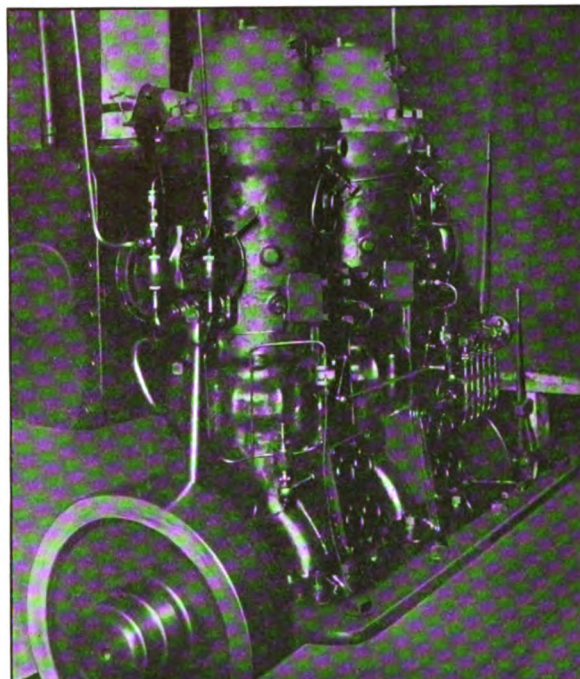
than a plain sailing vessel, but the auxiliary, when demasted at sea, can keep on its course and work its way into port, thus preventing heavy salvage charges and, often, the total loss of the vessel and crew.

Comparisons between auxiliary sailing ships and steam freighters as a

between Sydney and Hongkong. She shortly will take on a cargo and will leave under her own power for Sydney. GILBERT ISLANDS, which is classed under the Record of American and Foreign Shipping as A-1 for 12 years, has a net registered tonnage of 230, a length of 125 feet, a breadth of 31



AUXILIARY SCHOONER GILBERT ISLANDS



BOLINDERS ENGINE IN GILBERT ISLANDS

inder, direct reversible fuel oil engine of the Bolinders type, thus retaining the advantages and at the same time eliminating the many disadvantages, of the ordinary sailing vessel. One great advantage of the auxiliary is the ability of the owner to command higher freight rates, since such a vessel, by means of its auxiliary power, is able to complete its voyages on schedule time irrespective of wind or weather; in several recent cases, in fact, the higher freight rates obtained have enabled owners to make up the cost of the engine out of the profits of a single voyage. The auxiliary vessel is given precedence over the sailing vessel in docking, or in entering or leaving port, and towage expenses are entirely eliminated. Another great advantage is the added factor of safety. Not only can an auxiliary vessel be navigated more easily in bad weather and dangerous waters

class result greatly to the advantage of the former type. While the average speed maintained throughout a voyage is about the same for both types, the initial expenditure, depreciation, cost of repairs, and the cost of fuel and labor, frequently are higher for the steam vessel than for the auxiliary. The weight of a steam plant, and the amount of space it occupies, also are considerably greater than for the oil plant, thus resulting in greater cargo-carrying capacity for the auxiliary. Other advantages of the auxiliary are that there are no standby losses, or waste of fuel in raising steam, and also that such a vessel has a much greater radius of action without taking on a fresh supply of fuel.

GILBERT ISLANDS is owned by Tiy Sang & Co., fruit merchants, Sydney, Australia, and is destined for the South Sea islands fruit trade, plying

feet and a depth of 11 feet 9 inches. She is built of birch, oak and spruce, and her hull is sheathed to the load water line with 20 and 22-ounce yellow metal, a necessary precaution against the *toredo navalis*. In addition to the main engine, she is provided with a five brake-horsepower, stationary, oil engine of the Bolinders type, which is fitted forward for lifting the anchors, hoisting sails and cargo and for working a bilge pump. The main engine is located in the after end of the vessel, and the fuel oil tanks in the extreme after end. These have capacity for 3,500 gallons, sufficient for a radius of 3,500 to 4,000 miles on one filling. The vessel has an average speed of seven miles per hour, and the cost of the fuel at present prices figures out to less than 3 cents per gallon.

Bolinders marine oil engines are made in two different types. The direct-reversible type, such as in-

stalled on GILBERT ISLANDS, is provided with a solid propeller. It is made in sizes ranging from 5 to 500 brake-horsepower and is suitable for propelling any kind of craft, including high speed pleasure launches, passenger ships, tug boats, big cargo ships, lighters and barges and, particularly, sailing vessels. The second Bolinders type engine is designed for installations where a propeller with reversible blades is employed. This type is made in sizes ranging from 5 to 65 brake-horsepower, since strains encountered in turning the propeller blades would necessitate the use of complicated devices with larger engines. This type is used in fishing vessels and also in tugboats. Both types are 2-cycle and operate on heavy crude or residue oil, or on kerosene, the ignition being of the hot-bulb variety. The direct reversing of these engines is a very

W. R. Haynie in charge, as general manager, with offices at 30 Church street, New York. A large number of engines have been sold by the American office up to date, although it has been established only a little over a year. Engines ranging from 30 to 320 horsepower have been disposed of, including some 60 separate installations.

Soo Canal Report

The amount of freight moved through the canals at Sault Ste. Marie during October totaled 11,557,851 net tons, making the record month of the present season. The total movement to Nov. 1 was 59,941,454 tons as against 50,773,680 tons moved to Nov. 1, 1914, an increase of 9,167,774 tons. Of the 11,557,851 tons that passed through the canals during October,

Rehearing Asked

Arguments for a rehearing on the application of the Lehigh Valley railroad for authority to continue ownership of its vessels operating on the Great Lakes were recently made before the interstate commerce commission. Representatives of the chambers of commerce of Great Lakes cities appeared in behalf of the railroad, asserting that if all railroad owned vessels are taken out of the package freight business Dec. 15, according to the present orders of the commission, it will be impossible for any city along the Great Lakes to get package freight service.

A. H. Elder, one of the interstate commerce commission attorneys, opposed the proposal, taking the position that independent capital will supply the package freight service now

Lake Carriers Come to the Rescue

AT THE federal building in Cleveland, a young man who is proficient in spelling and Spencerian script is working diligently at present. He is not a government employee. He was hired by the Lake Carriers' Association as an aid to the doctor whose business it is to examine candidates for seaman's papers under the new La Follette law. The young man's job may last a week, a month, or even more. He is very busy, writing down the physician's findings as to the physical fitness of prospective A. B.'s.

Another young man, also sent down to the federal building by the

Lake Carriers' Association, is of great assistance in lining up the sailors and getting them ready with blank certificates and down-gyved suspenders for the M. D.'s verdict. It is said that these two young chaps have expedited the work of the federal inspectors more than 100 per cent.

Why did the shipping men hire these helping hands? Experience had taught that government is not always as far sighted as it might be, in preparing for work which must be done. The Lake Carriers' Association decided to obey the law to the letter and to spare no efforts in

facilitating its operation, in order that its efficiency might have a fair test. Red tape or no red tape, somebody had to lend a hand without regard to small distinctions of responsibility; and as many a time before, it was the Lake Carriers who did it. Of course the results were to their interests as well as to that of other shipping organizations and individuals, whom they served without distinction. But they deserve credit for stepping into the breach when help was badly needed. Their action furnishes a contrast to the dilatory tactics of a government, which imposes a law and then fails to provide for its operation.

important feature as it means that the reversing is carried out without the aid of compressed air and by doing away with complicated reversing gears, which are a source of power losses, the full power of this engine is applied to the propeller when going astern. Reversal in either direction is accomplished in four or five seconds, and the engine may be reversed as often as required, thus facilitating the maneuvering of the vessel in cramped quarters.

Bolinders oil engines have been manufactured at the plant of the Bolinders Co., Stockholm, Sweden, for the past 25 years, during which time they have been shipped to all parts of the world. The output of the plant now is approximately 60,000 horsepower annually. In addition to marine engines, the company manufactures oil engines for stationary plants. In July, 1914, the company established a branch office in this country with

2,265,934 tons went through the Canadian canal and 9,291,917 through the American canal. The summary follows:

EAST BOUND.

	To Nov. 1, 1914.	To Nov. 1, 1915.
Copper, net tons.....	60,584	117,651
Grain, other than wheat, bushels	49,476,500	35,195,203
Building stone, net tons		
Flour, barrels	8,130,462	6,664,067
Iron ore, net tons.....	30,294,290	40,638,322
Pig iron, net tons.....	15,713	15,640
Lumber, M. ft. B. M.	408,178	416,352
Wheat, bushels	109,323,913	131,926,082
Unclass. frgt., net tons	223,291	267,837
Passengers, number ...	28,439	22,262

WEST BOUND.

Coal, anthracite, net tons	1,827,211	1,708,922
Coal, bituminous, net tons	11,323,334	9,749,346
Flour, barrels	662	100
Grain, bushels		31,623
Mixed iron, net tons.....	196,223	158,515
Iron ore, net tons.....	3,496	1,500
Salt, barrels	651,256	603,586
Unclass. frgt., net tons	927,350	1,093,133
Passengers, number ...	30,862	24,331

SUMMARY OF TOTAL MOVEMENT.

East bound, net tons..	36,398,565	47,139,174
West bound, net tons..	14,375,115	12,802,280
Total	50,773,680	59,941,454
Vessel passages	17,065	18,138
Net registered tonnage	38,840,433	47,862,258

furnished by railroad owned vessels. Representations were made to the commission that owing to the abnormal shortage of lake vessels, ships that have been used in the package freight business have been placed in the bulk freight business in order to help take care of the enormous shipments of ore and grain from the head of the lakes. Claims have been made that if the commission does not modify its present orders requiring the railroads to sell all their lake line boats before Dec. 15 most of them will be taken from the lakes and placed in the ocean trade, thereby making it impossible to relieve the situation by the operation of the ships under independent management.

The Donaldson Steamship Line has purchased from J. Little & Co., of Glasgow, the steamship BORDERDALE, built at Greenock in 1905. The price was around \$475,000.

In the Traffic Manager's Office

A Review of the Charter Market on Coasts and Lakes—Pointers
for the Men Who Get the Business

Pacific Trade is Now in Nippon's Hands

WITH every American ship yard working to capacity; with the list of foreign ships seeking United States registry increasing; with the augmentation of the nation's already large coastwise traffic and the growth of amicable relations between us and our excellent neighbors to the southward, it is impossible for the American shipping world to be pessimistic.

There is, however, a big difference between unreasoning pessimism and a healthy, legitimate disgust at conditions which, though no doubt temporary, are mighty irritating.

It is difficult for men in maritime circles, as well as large exporters and importers whose interests are bound up with ocean traffic, to view Pacific ocean developments of recent weeks with equanimity. With the Dollar boats under the British flag and the Pacific Mail out of business, with the suspicious willingness of certain other lines to suspend operations under the American flag, and corresponding activity on the part of Japanese and Chinese shipping interests, the prospects for our transpacific trade are scarcely cheery just now. When matters come to the pass that we cannot even get accommodation for our goods on Nipponese liners on account of their preference for the subsidy-favored goods of their own people, the situation may only be described in the words of W. S. Gilbert—"Here's a howdydo!"

"General prospects for increasing our trade with the orient," says Willard Straight, president of the American Asiatic Association, "seem more promising than at any time in recent years. But, notwithstanding this fact, we are confronted by a situation which may make it almost impossible for us to take advantage of present opportunities. The Pacific Mail Steamship Co. and the Robert Dollar Co., which have been long among the principal carriers of our export trade to and our import trade from the

orient, are no longer operated under the American flag.

"The Pacific Mail steamers, for years run at a considerable loss, have now been sold because the provisions of the La Follette seamen's bill imposed an increased cost of operation which was absolutely prohibitive. Captain Dollar has placed his steamers under the British flag. Practically no vessel flying the American flag will, as far as I can learn, be engaged in the transpacific trade.

"This situation occurs at a time when there is little British or tramp shipping available, and American merchants are, therefore, obliged to rely upon Japanese carriers. The Japanese lines are heavily subsidized, and, therefore, must necessarily prefer their cargo to our own. They would in any case be unable to provide us with the facilities which we require."

* * *

AMERICAN exporters and importers who deal with the far east declare that the actual advances in rates, on the transpacific lines within a few months, in many instances have been as high as 50 and 75 per cent. Japanese steamship line officials are credited with the admission that they have all they can do to handle strictly Japanese freight going to or from Japanese ports, and therefore must leave behind all other shipments coming to or going to Chinese ports.

Trade factors report that their situation rests entirely with the ability of tramp steamers to take up their shipments to China or bring them forward from Chinese ports. In other words, the shippers explain, as the result of the withdrawal of the Pacific Mail and other steamship lines from the transpacific routes, while Japanese freight is coming forward for Japanese shippers, shipments either to or from Chinese ports and the United States at the present time are being handled in only the smallest degree.

Importers of tea, matting, rice and other oriental products are complain-

ing that their importations have been practically tied up as the immediate result of an order issued a short time ago by the Japanese government, reserving for Japanese shippers all space on vessels operated by the subsidized Japanese transpacific lines. At the same time, it is said, while American importers are suffering from these conditions, the Japanese importing houses on the Pacific coast have been able to obtain almost unlimited quantities of competitive merchandise. The result has been, according to the American importers, that they have experienced serious financial losses, their usual customers turning to the Japanese import houses for supplies.

* * *

THE Toyo Kisen Kaisha Steamship Co. has obtained from the California board of state harbor commissioners an additional amount of dock space at San Francisco, the application being accompanied by the explanation that as the company has added five vessels to its transpacific fleet operating to San Francisco, its present pier, already congested, would prove entirely inadequate.

In addition to the steamers mentioned in these proceedings, the company has made arrangements for a sixth, with the result that it will be able to operate a total of 10 vessels on the run between San Francisco and the orient.

This company now has in this service the steamers SHINYO, CHIYO, TENYO and NIPPON MARU, and has added PANAMA, SEATTLE, DARIEN, SHINYO MARU II and the former Pacific Mail liner PERSIA.

The Osaka Shosen Kaisha has opened a transpacific service between Japan, Honolulu and San Francisco. There are now three Japanese passenger steamer lines calling at Honolulu. Of 44 ship arrivals from Sept. 1 to 22, inclusive, 10 were Japanese.

"What the ultimate level of freight rates on the Pacific will be, as a direct result of the recent

changes and the general contraction of available tonnage is a matter of considerable uncertainty, though all shipping experts declare that a marked advance in rates is inevitable and imperative, and the only question is as to how marked the advance will be and what ultimate level will be reached," says George E. Anderson, American consul general at Hongkong.

"The latest actual announcement in this connection is that of the Osaka Shosen Kaisha as to an advance in freights on American products shipped from Tacoma and Puget sound ports to the orient. This advance on American produce in some respects is significant. The rate announced is one of \$5.50 gold on flour and wheat to Japan and \$6 gold on the same commodities to Manila and Hongkong. The rate on lumber is to be \$9 to Japan and \$11 to Hongkong and Manila per 1,000 board feet. The

rate on dried fish is to be \$6.50 to Japan and \$7.50 to Hongkong and Manila, per measured ton. These rates are well toward twice the rates obtaining on the same commodities before the opening of the war in Europe.

"The chief significance of the rates," adds Mr. Anderson, "lies in the fact that it is on American freight outward rather than on Japanese freight homeward that the advance is made. The fact of the matter is that advances on Japanese freight homeward are probably to be comparatively few and of slight moment. Heretofore in all advances of rates by the conference lines the Japanese government, controlling the Japanese lines by the subsidy paid them for their services, has prevented marked advance in homeward rates on freight in which Japan was interested. This policy is undoubtedly to be followed in the coming readjustment. In other words,

Japanese interests, through the subsidies paid their lines, are to control rates for the benefit of Japanese trade."

* * *

AN INTERESTING ceremony recently held at San Francisco was the breaking out of the new China Mail Steamship Co.'s house flag on the main truck of the liner CHINA, which is one of the infant line's first ships. The emblem was christened by the breaking of a bottle of California wine over its folds by Miss Rosa Lew Hing, daughter of the vice president of the Canton bank, San Francisco, and an official of the China Steamship Co. CHINA sailed soon afterward for Hongkong, inaugurating the line's service between San Francisco and the orient.

This ship was a former member of the defunct Pacific Mail Steamship Co., and was recently transferred from American to Chinese registry.

U. S. Coastwise Trade is Flourishing

WHETHER there is any sort of inverse relation between the development of the United States' coastwise merchant marine and its transatlantic and transpacific commerce, is a problem not yet deciphered by the scientists; but to an onlooker, such would seem to be the case. While the American flag in the past few years has become a curiosity in foreign ports, it continues to flourish in coastwise traffic, in which some protection is assured American merchants. During the past few weeks several new lines have been founded and many others augmented by purchases, transfers or contracts for ships. One of the most noteworthy maritime happenings recently was the incorporation by American and English interests of the Southern Cross Line, to operate between New York and South Atlantic ports under the American flag. The service later will be enlarged to include gulf and South American ports. The organization has a capital stock of \$3,000,000.

It will be under the supervision of Bowring & Co., one of the oldest shipping agencies in New York, which represent large English interests. New York, Charleston, Jacksonville and New Orleans capitalists are associated with the latter. Contracts will soon be placed for the construction of four freight steamers of 4,000 tons.

The Cramp ship building company has

contracted to build two ships for the Atlantic, Gulf & West Indies Steamship Co. Two ships are under construction on the Pacific coast for this line, besides three new vessels on the Atlantic seaboard. The two new ships to be built in Philadelphia will bring the total up to seven.

The Great Northern Pacific Steamship Co. will inaugurate a new steamer service from San Francisco to the Hawaiian Islands, the steamer GREAT NORTHERN leaving San Pedro on Nov. 26 for Hilo, Honolulu and return to San Francisco. The steamer is expected to make Honolulu in four days and a half, connecting there with transpacific lines to the orient. The line will maintain a regular 20-day schedule between Los Angeles, Hilo, Honolulu and San Francisco.

The Southern Pacific Steamship Co. is having two large steamers built at the Newport News ship yard for coastwise trade between New York and gulf ports of the United States. The steamer CHALMETTE was recently transferred from the New Orleans-Havana service to the New York-Galveston trade.

"We need ships for the growing business of New Orleans and Galveston and other gulf ports," declares C. W. Jungen, manager of the company's Atlantic lines, "and we will have two great additions to our freight fleet just as soon as the ship yard can produce them. These two new

vessels will be larger than any of the freighters now in our service." The Southern Pacific now has a considerable freight fleet plying between New York and gulf ports, but its coastwise freight business has shown such great gains in the past few months that the company also has chartered six vessels for its northbound service from Galveston. MARIANA and COROZAL, owned by the New York and Porto Rico line; YAGUEZ, owned by the Ward line, but formerly operated by the Bull Insular line, and TALLAC, WILHELMINA and HENRY T. SCOTT, which plied in the Panama canal coastwise trade, are the six which have been chartered. The two New York and Porto Rico boats and the Ward liner have a capacity of about 4,000 tons each, while the canal steamers have an average capacity of 2,800 to 3,000 tons. The Southern Pacific is also negotiating for additional steamers to facilitate eastbound traffic from Pacific ports by way of Galveston. The company will have 18 steamships in the northbound service out of Galveston in the near future.

The banana trade between Central American ports and the United Kingdom having come practically to a standstill, the United Fruit Co. has taken over for operation to and from American ports five steamers of the Elder-Fyfe fleet, formerly plying between Central America and the United Kingdom, which will thus be diverted

to American ports. They include ARACATACA, TORTUGUERO, ZENT, BARRANCA and SAN MATEO.

The Elder-Fyfe steamers are being operated in the banana trade between Central America and United States ports under the British flag. It is reported that they are soon to be transferred from British to American registry. With the completion of the necessary formalities in changing the registry of the five steamers, the United Fruit Co. will have transferred no less than 29 of its vessels from British to American registry since the outbreak of the war.

The company began the transfer of its fleet of steamers from British to American registry almost immediately after the act of Aug. 19, 1914, was approved by congress. Twenty-four of the company's steamers changed to American registry within two months after the law was passed.

E. C. Evans & Sons, San Francisco, have been made agents of the Bank steamship line. Following the withdrawal of the Pacific Mail Steamship Co. from the transpacific trade routes, the English lines have considered the service a good opportunity to extend their fleet. Thus the Bank steamship line will operate vessels from Pacific coast points to the orient. Another new freight service by a Dutch steamship company is also expected to be announced in the near future when the Java-China line, a Netherlands concern, will begin operating a monthly steamer from Java via Manila and Hongkong to San Francisco beginning this month.

The Alaska Steamship Co., Seattle, has purchased two steamers on the Atlantic coast and will bring them out to the Pacific by way of the Panama canal. They are BURLINGTON and BENNINGTON, which have been in operation for a number of years on the Great Lakes as ore carriers. The purchase price is said to have been \$400,000. The steamers will be made ready for the Alaska trade as soon after their arrival on the Pacific coast as possible. BURLINGTON and BENNINGTON were built seven years ago at Ecorse, Mich., for the Rutland Transit Co., a subsidiary of the New York Central Railroad Co. They will be used in the Alaska Steamship Co. for bringing ore from Alaska mines to the smelters at Tacoma.

A direct steamship line between Puget sound and France is proposed by a French consular representative on the Pacific coast, who is holding frequent conferences with business men whom he has interested in the project through the branch office of the department of commerce.

Three Dollar Rate Holds

Panama Railroad Will Not Boost Tariffs
as Announced—Slide Causes Trouble

WHAT threatened to be a battle royal between the government owned Panama Railroad Co. and the steamship lines shipping freight through the Panama canal and now held up by the recent disastrous slides in the Culebra cut, has been averted by the suspension of the ruinous rates announced by the former. A temporary flat rate of \$3 per ton has been fixed by order of the war department for shipment of goods across the isthmus. The railroad is extending its facilities as best it can to expedite the movement of perishable cargoes from the Pacific to the Atlantic side. Dredging operations on the canal are being carried on at high pressure, a total of about 208,000 cubic yards of soil being removed per week. The tremendous pressure of sliding earth and rock has forced up an island in the channel, as illustrated on another page of this issue of *The Marine Review*. It is feared that canal traffic may be held up for several months.

The new rate of \$3 per ton includes all wharfage, craning, stevedoring, and transfer charges on the dock as well as the rail haul. It takes the place of a sliding scale designed by the Panama railroad, which would have gone into effect Nov. 1, and would have varied from \$2.50 to \$15 a ton. When this rate was announced, vigorous protests were made by several lines, especially by the Luckenbach line, which declared that such a step would virtually force it out of business. The protests were augmented by those of large Pacific coast shippers whose business was seriously endangered by the contemplated raise in rates.

Fifty per cent of the cargo capacity of the regular Panama steamers, it is said, has been automatically wiped out by conditions arising out of the landslide blockade. The prospective financial losses which confront the regular Panama lines have been estimated at more than \$500,000 for each month that the canal remains closed to navigation. These losses include extra expenses on temporary service by railroad across the isthmus, the use of the 30-day longer route via Magellan, 50 per cent loss in scheduled sailing time for the steamers and coincident inability to carry the usual heavy cargoes.

Officials of the Luckenbach Steamship Co. declare that, owing to the

limited loading and unloading facilities available at the Cristobal and Balboa entrances on the Panama railroad route, the transshipping of cargoes across the isthmus will not permit of the "turning" of a ship within less than 15 days, while the ordinary time in which vessels through the canal have been "turned" is seven days. At the Cristobal entrance are only 13 piers available for wharfage, and only five at Balboa.

It is said that the closing of the canal has resulted in such heavy expenses to the steamship lines that most of them are leaving the coast-to-coast routes. It is intimated that when the slide is removed there will remain but two of the lines in operation between the Atlantic and Pacific. If the canal is closed for eight or nine months, it is said, the loss of the American-Hawaiian Line will be about \$5,000,000, and probably three-fifths as much will be lost by the Luckenbach Line.

The average daily losses of the Panama steamers arising out of the blockade are fixed at about \$1,600. The aggregate steamer losses are therefore extremely heavy, when it is considered, for instance, that the American-Hawaiian Line is using no less than 16 large-sized vessels in the Panama trade, while the Luckenbach and Grace interests are operating more than 12.

On some of the larger Panama steamers the average daily losses reach as high as \$2,500. The average period of extra delay involved in the case of the Luckenbach ships, which are transshipping their cargoes across the isthmus via the Panama railroad, is 10 days, while on the ships of the American-Hawaiian Line, which are utilizing the alternative Magellan route, the extra voyage involved is 30 days. The fact that the lines do not have to pay any tolls for passage through the canal is not held to be an important item for consideration, inasmuch as it is fixed at about 85 cents per ton, which is easily absorbed by the additional fuel oil expenses to be met by the lines through the use of alternative and longer routes, as well as the delay at the entrances to the waterway, before actual exchange of cargoes overland may be attempted.

The heavy extra costs to canal carriers have compelled them to raise their rates materially. In fact, the

increase necessitated is so large that the lines complain that "competition" between them and all-rail or rail-and-water carriers not using the canal has become a myth.

Within the past three months the struggle between the all-rail, and rail-and-water lines and the all-water Panama ship lines for the coast to coast traffic became so acute that the rail carriers filed and are now awaiting decision by the interstate commerce commission on a petition to lower their rates to a competitive basis with the water lines.

There were about 375,000 tons of cargo in the vessels awaiting transit

Fix Navigation Lanes

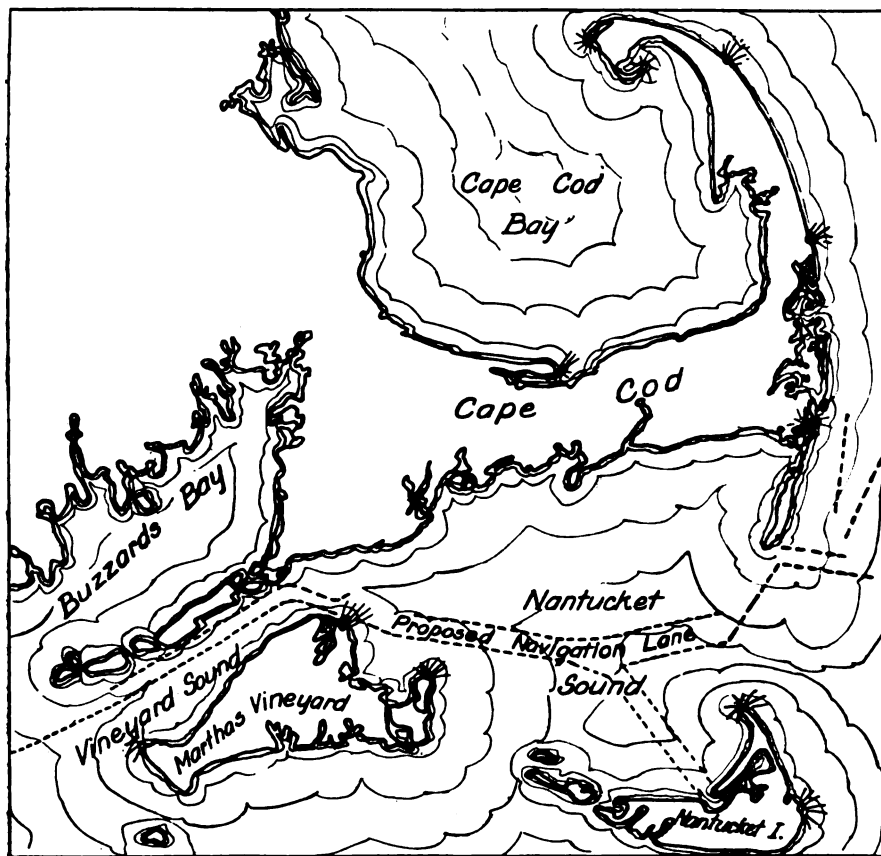
At a final conference at the chamber of commerce in Boston, Oct. 19, regarding proposed anchorage limits and clear navigation lanes in Nantucket and Vineyard sounds, Mass., it was decided to recommend that anchorage limits be laid out, under the special provision in the river and harbor act of March 4, 1915, so as to define navigation lanes through the sounds substantially as indicated on the sketch map presented herewith. This will provide for a clear course for vessels passing through the sounds and also for the vessels running between New

Chorages and clear navigation lanes. The protest was based on the contention that the proposed anchorages, etc., would soon be rendered unnecessary by the availability of the Cape Cod canal for vessels now using the sounds, and that to lay out the navigation lanes and patrol them would involve useless expense. It was the unanimous view of those present that the Cape Cod canal does not warrant deferring action to define anchorages and safe lanes for navigation through Nantucket and Vineyard sounds.

Rate War to Stop

By F. K. Haskell

Taking the initiative for the first time, in the rate war which has been going on between four companies and individuals operating freight and passenger vessels between Seattle, Bellingham and the San Juan islands, the Washington state public service commission has filed a formal complaint against the companies involved in the rate-cutting controversy. Those named as defendants include the Puget Sound Navigation Co., successor to the Island Navigation Co., which operates vessels between Seattle, Anacortes, Bellingham and the San Juan islands, making the "loop" of the sound; the Kingston Navigation Co., operating between Seattle, Port Townsend and the islands; the Inter-island Navigation Co., running between Bellingham, the San Juan islands and Anacortes, and W. H. Kasch, an individual, operating a vessel on the same route. The public service commission, in its complaint assumes jurisdiction to name a time and place for hearing. According to the complaint, tariffs and supplemental schedules filed with the commission show that the four companies are engaged in a "demoralizing rate war", which will ultimately result in poorer service. Both freight and passenger rates have been slashed, for the purpose of driving out competitors, says the complaint.



MAP OF TRAFFIC LANES AS ADOPTED

through the canal, before any of them left to go by longer routes. At the height of its activity, the Panama railroad hauled a total of 643,178 tons of through freight between the seaboards in 12 months.

Furness, Withy & Co., Ltd., have purchased three large cargo steamers for use in their new service between Philadelphia and Glasgow. All of the steamers are vessels which have been built within the last few years and are 11-knot boats. They are DEN OF KELLY, which is 4,662 tons gross and 2,999 tons net; DEN OF GLAMIS, which is 5,191 tons gross and 3,318 tons net, and DEN OF RUTHVEN, which is 4,937 tons gross and 3,116 tons net.

Bedford and the harbors of Marthas Vineyard and Nantucket islands. Recommendation is to be made that the locality be patrolled by a vessel of the coast guard, as the law contemplates, to see that the anchorage limits are observed as far as practicable, and to observe the conditions when it may be found impracticable for a vessel to conform to the prescribed anchorages. It is proposed to give the lay-out of anchorages and navigation lanes a practical test for one year, when the subject will be considered as reopened for revision.

Full consideration was given to the protest submitted by the Boston, Cape Cod & New York Canal Co. against establishing the proposed an-

Quote Rates in Dollars

"Most of the shipping agents in quoting freight rates to the orient now use dollars and cents instead of pounds, shilling and pence," said a New York exporter recently. "I have been accustomed to getting rates in sterling, so that when I asked and got from six steamship lines, rates to oriental ports the other day, and found that all their answers were expressed in terms of American money, I was rather startled. But this is evidence that the dollar has come into its own, and is probably going to be the world's standard of exchange."

Lake Ship Yards Take Many Orders

Big Revival Along Great Lakes and Contracts Already Placed Call for 1916 Delivery on 27 Vessels

By R. V. Sawhill

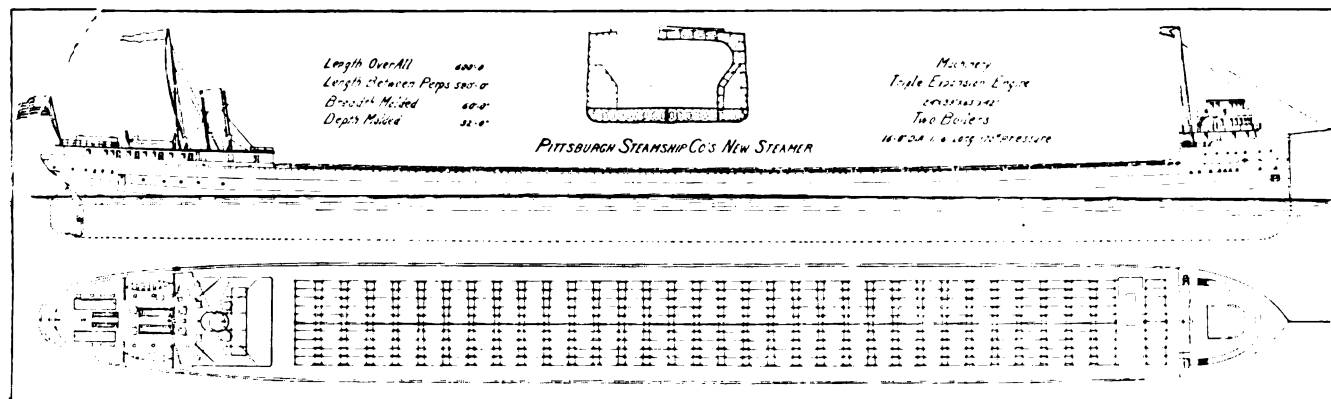
LAKE ship builders are now talking deliveries. The industry has revived with a rush and during the past few weeks sufficient orders have been taken to insure capacity operations at a number of the ship yards for the next 10 months. The new work includes a number of lake freighters coupled with an overflow of ocean going vessels that the coast yards were unable to build within the time specified by the shipping interests. The contracts recently booked by lake yards call for 27 vessels, with an approximate carry-

beam, 2 feet more than the last 600-foot freighters built on the lakes.

Of the vessels already ordered, the American Ship Building Co. has taken 10, with a carrying capacity of 57,000 tons. The Great Lakes Engineering Works has orders for eight vessels, with a carrying capacity of 42,000 tons. The Toledo Ship Building Co., Toledo, O., will build five vessels of approximately 26,000 tons carrying capacity while the Manitowoc Ship Building & Dry Dock Co., Manitowoc, Wis., has orders for four boats of 4,700 tons capacity. In addition a fire

Scotch boilers. They will be of Isherwood construction and will be built under Lloyds inspection to class A1. They will have 9-foot hatches, spaced on 12-foot centers. Their general features are shown in the accompanying illustration.

When these vessels are completed, the Pittsburgh Steamship Co. will have 23 steamers of 600 feet or over. The Interlake Steamship Co. will have a fleet of 37 steamers and two barges. Its new boat, together with the steamer W. B. DAVOCK, which was purchased a few weeks ago, will replace



GENERAL FEATURES OF NEW BULK FREIGHTER ORDERED BY PITTSBURGH STEAMSHIP CO.

ing capacity of 129,700 tons. These include five 12,000-ton bulk freighters, two additional bulk freighters for lake service, 12 Welland canal size steel freighters, four auxiliary schooners for the coast, three trawlers and a survey steamer.

To Build Ocean Boats

The revival is marked by two interesting features. Lake builders have never competed seriously with seaboard ship yards previously, but during the past year they have proved their ability to take business in any quarter of the world. The four ocean-going vessels ordered in the spring from the Great Lakes Engineering Works, Detroit, are nearing completion, one having been delivered at New York, a second is en route to that port while the other two will leave for the coast within a few days. The second feature of interest is the slight modification in the size of the new bulk freighters for the lakes. Each of these vessels will be 60 feet

boat for the city of Cleveland is being built at the Manitowoc yard.

Two of the bulk freighters were ordered by the Pittsburgh Steamship Co., Cleveland, the American Ship Building Co. and the Great Lakes Engineering Works each securing a contract for one vessel. The Interlake Steamship Co., Cleveland, and the Franklin Steamship Co., Cleveland, each ordered one vessel from the American company. The Great Lakes Steamship Co., Cleveland, placed its order with the Toledo Ship Building Co.

The five bulk freighters are all duplicates, with the single exception that the Toledo-built boat will have quadruple expansion instead of triple expansion engines. Each freighter will be 600 feet overall, 580 feet keel, 60 feet beam and 32 feet deep, with a carrying capacity of 12,000 tons. Four of them will have triple expansion engines, with 24½, 42 and 65-inch cylinders and 42-inch stroke. Each vessel will be equipped with three

ARGUS and HYDRUS, lost in the big storm of November, 1913. The Franklin Steamship Co., of which Herbert K. Oakes is manager, now owns the steamers E. J. EARLING and E. H. UTLEY. The Great Lakes Steamship Co. operates a fleet of 21 freighters.

Big Increase Over 1915

All of the lake boats will be delivered by September, 1916. Those that were ordered first will go into commission in the spring. The orders for these freighters was particularly pleasing to lake interests, as during 1915 only one bulk freighter was launched. This vessel was W. F. WHITE, which was described in detail in *The Marine Review*, October, 1915. In 1914, seven bulk freighters were launched; in 1913, five; in 1912, five; in 1911, five; in 1910, 20; in 1909, 17; in 1908, 24; in 1907, 40; in 1906, 40; in 1905, 29; in 1904, seven; in 1903, 42, and in 1902, 30. That this building program has not provided sufficient capacity to handle lake freight in

the short season of navigation is demonstrated both by the unsatisfied demand for vessel capacity this fall which will force many of the boats to run later than scheduled, and by the orders now being placed.

Few details have been made public relative to the two other large freighters ordered for lake service. Both of these vessels will be built by the Great Lakes Engineering Works, one being 450 feet long, with an approximate capacity of 9,000 tons, and the other designed for the stone trade, having a capacity of 6,000 tons.

Of the 20 other boats ordered, six were placed by Norwegian interests, five others are for salt water, one for lake service, four are auxiliary schoon-

burg, N. Y. The four auxiliary schooners are being built for the Smith Shipping Co., New York. They will be steel, full Welland canal size. Oil burning engines will be installed upon the arrival of the vessels at the coast. Their speed will be about seven knots an hour.

The three trawlers were ordered by the Bay State Fishing Co., Boston. They will be 140 feet long, 22½ feet beam and 12½ feet deep. The survey steamer will be equipped with oil-burning engines, and will have a cruising radius of 4,000 miles. Her contract speed is 12 knots.

The four steamers for salt water, ordered from the Great Lakes Engineering Works some months ago,

Sells Last Boats

The Rutland Transit Co., which operates a line of steamers on the Great Lakes, has sold its last two vessels, RUTLAND and OGDENSBURG. The purchaser is the Pacific-Alaska Navigation Co., Seattle, Wash. The sale of these two vessels makes six which have been disposed of by the Rutland Line as a result of the Panama canal act divorcing the lake lines from the railroads. Last spring the company sold ARLINGTON and BRANDON to the New England Coal & Coke Co., Boston, and later it disposed of BURLINGTON and BENNINGTON to the Alaska Steamship Co., Seattle.

The Eric railroad lake line sold

Details of Ships Now Building

AMERICAN SHIP BUILDING CO., CLEVELAND, O.

		Dimensions in feet.				Approximate carrying capacity.		For whom building.
To be built at.	Type.	Over all.	Keel.	Beam.	Depth.	Engines.	Boilers.	
Lorain.....	Bulk Frtr..	600	580	60	32	24½, 42, 65 x 42	3 Scotch	Pittsburgh Steamship Co., Cleveland, O.
Lorain.....	Bulk Frtr..	600	580	60	32	24½, 42, 65 x 42	3 Scotch	Interlake Steamship Co., Cleveland, O.
Cleveland.....	Freighter ..	261	251	43½	20	—	—	Norwegian interests.
Cleveland.....	Freighter ..	261	251	43½	20	—	—	Norwegian interests.
Lorain.....	Bulk Frtr..	600	580	60	32	24½, 42, 65 x 42	3 Scotch	Franklin Steamship Co., Cleveland, O.
Wyandotte.....	Freighter ..	261	251	43½	20	—	—	Norwegian interests.
Wyandotte.....	Freighter ..	261	251	43½	20	—	—	Norwegian interests.
Wyandotte.....	Freighter ..	261	251	43½	20	—	—	Norwegian interests.
Wyandotte.....	Freighter ..	261	251	43½	20	—	—	Norwegian interests.
So. Chicago....	Freighter ..	260	250	42	20	—	—	G. B. Hall Coal Co., Ogdensburg, N. Y.

GREAT LAKES ENGINEERING WORKS, DETROIT, MICH.

Ecorse.....	Bulk Frtr..	600	580	60	32	24½, 42, 65 x 42	3 Scotch	Pittsburgh Steamship Co., Cleveland, O.
Ashtabula.....	Freighter ..	260	250	42	19	—	—	Merritt & Chapman Co., New York.
Ecorse.....	Freighter ..	..	..	..	..	—	—	Stone trade.
Ashtabula.....	Freighter ..	260	250	42	19	—	—	For coast service.
Ecorse.....	Freighter ..	260	250	42	19	—	—	For coast service.
Ecorse.....	Freighter ..	260	250	42	19	—	—	For coast service.
Ecorse.....	Freighter ..	..	450	56	..	—	—	For lake service.
Ecorse.....	Freighter ..	260	250	42	19	—	—	For coast service.

TOLEDO SHIP BUILDING CO., TOLEDO, O.

Toledo.....	Auxil. schr.	260	250	42	19	Auxil. oil burning	—	Smith Shipping Co.
Toledo.....	Auxil. schr.	260	250	42	19	Auxil. oil burning	—	Smith Shipping Co.
Toledo.....	Auxil. schr.	260	250	42	19	Auxil. oil burning	—	Smith Shipping Co.
Toledo.....	Auxil. schr.	260	250	42	19	Auxil. oil burning	—	Smith Shipping Co.
Toledo.....	Bulk Frtr..	600	580	60	32	—	3 Scotch	Gt. Lakes Steamship Co., Cleveland, O.

MANITOWOC SHIP BUILDING & DRY DOCK CO., MANITOWOC, WIS.

Manitowoc.....	Surv. vessel	186	160	34	20½	1,000-H. P.	2 Scotch	U. S. Coast & Geodetic Survey.
Manitowoc.....	Trawler ...	140	...	22½	12½	—	—	Bay State Fishing Co.
Manitowoc.....	Trawler ...	140	...	22½	12½	—	—	Bay State Fishing Co.
Manitowoc.....	Trawler ...	140	...	22½	12½	—	—	Bay State Fishing Co.

ers for the coast trade, three are trawlers and one a government vessel.

With the exception of the trawlers and survey steamer, all of these boats are steel freighters of full Welland canal size. They will be about 260 feet long, 42 feet beam and 20 feet draught, with an approximate carrying capacity of 3,000 tons. The auxiliary schooners, however, will have an approximate carrying capacity of 3,500 tons.

The Great Lakes Engineering Works will build five of these freighters, one being for the Merritt & Chapman Co., New York, for wrecking work on the coast. The American Ship Building Co. will build seven canalers, six for Norwegian interests, and the other for the George B. Hall Coal Co., Ogdens-

burg, N. Y. The four auxiliary schooners are being built for the Smith Shipping Co., New York. They will be steel, full Welland canal size. Oil burning engines will be installed upon the arrival of the vessels at the coast. Their speed will be about seven knots an hour.

A new steamer has been launched for the Harrison line at the yards of Charles Connell, Scotsoun, and christened BARRISTER. The new liner, which will probably find her way into the company's service from Liverpool to Tacoma, is 365 feet in length. The Harrison line has lost several freight steamers since the beginning of the war and the new vessel has been named for a former vessel of the fleet which was lost.

four of its vessels recently. The railroads assert that unless the law is repealed other lines will likewise be forced to sell their vessels. The situation brought about by the interstate commerce commission's decision, relative to railroad owned steamship lines, was discussed at length in *The Marine Review*, July, 1915.

Dock Commissioner R. A. C. Smith, of New York, has awarded to Post & McCord, a contract for the construction of a pier at the foot of Thirty-fifth street, Brooklyn, thus placing three piers to be built in that section under contract. The bid which was accepted from the engineering company amounted to approximately \$297,000.

The Port Facilities of New Orleans

A Summary of Methods of Administration That Have Fostered the Growth of a Great Seaport

By Ernest M. Loeb

THE FRENCH pioneers chose for the site of the city of New Orleans a most advantageous geographical location at a point on the Mississippi river, 110 miles from the Gulf of Mexico, where a deep water harbor may be developed on both sides of nearly 200 miles of stream. The river, forming a letter S around the city proper, establishes a physical crescent which gave the city the appellation, "Crescent City".

Until 1901 the facilities of the port of New Orleans were provided by private interests through lease of the river frontage. The wharves were temporary structures; there were no sheds; there was no machinery, and charges assessed against vessels were considered excessive.

In 1896, the Board of Commissioners of the Port of New Orleans was created by act of the legislature—the commissioners, five in number, being appointed by the governor of the state, and serving without compensation. By the original act, and successive legislation, this board exercises great authority, and, in the interest of the commerce of the port, may expropriate property, build and operate wharves, sheds, warehouses and other facilities essential to the ocean and river shipping of the port.

The first board, which took charge of the facilities in 1901, was somewhat handicapped through having no other available funds than revenues produced by charges upon shipping. After a few years, however, the legislature authorized the board to issue bonds, and, with the proceeds of these bonds, wharves and sheds were constructed. In 1914, other bonds were issued for construction of a cotton warehouse; in 1915 for a grain elevator, and, in 1916 an industrial canal and other warehouses may follow.

Port development consists, not only of physical structures, natural or artificial, but also of features of finance and administration. Governmental organizations, such as states and cities, in financing improvements, such as the development of harbors, should apply the principles and established

processes of corporation financing, particularly in the elimination of a large number of bond issues, usually existing, and re-establish their finances on a comprehensive basis, so that, under proper regulation, installments of securities can be issued from time to time for needed improvements and extensions.

In pursuance of a broad policy of financing, the board has authorized

Port Needs

The fullest development of all ports depends largely upon the following essential items:

- 1.—*Wharves with unloading, loading, conveying and transporting machinery and appliances.*
- 2.—*Slips with fixed or portable dredging machinery.*
- 3.—*Terminal railroad yards.*
- 4.—*Motor roadways.*
- 5.—*Belt railroads.*
- 6.—*Car lighterage or car ferry equipment for loading direct from car to vessel simultaneously with the loading from wharves.*
- 7.—*Floating wharves consisting of freight lighterage equipment.*
- 8.—*Deposit warehouses for principal commodities.*
- 9.—*Manufacturing lofts.*
- 10.—*Dry docks.*
- 11.—*Industrial ship basins for the location of manufactories.*
- 12.—*Lateral canals affording access by water direct to industries and warehouses.*

an issue of \$25,000,000 of bonds to be sold, as occasion may require and as our revenues may justify, for the ultimate development of the port to its highest usefulness. These bonds may be issued only in the event the net income of the port for the preceding 12 months shall have been at least 1½ times the annual interest charge upon such additional bonds. New Orleans port bonds have been passed upon by lawyers of national reputation, and local bankers have aided in their sale materially.

In general, any proposed port improvement should be more than self-

sustaining. The gross earnings of a port should be such as to insure sufficient net earnings after operating expenses, including maintenance, to meet not only interest charges, but to provide for various reserve funds, including renewal and replacement reserves; minor extensions; and emergency reserves to be used for construction purposes during periods of financial depression, or while the sale of port obligations is pending.

There exists in the ports of the United States the greatest diversity in systems of port charges. No basic principles seem to have been applied in these tariff structures. The principles of rate schedules are absolutely the same in all businesses, there always being a readiness-to-serve charge and a service charge. The service charge should be based upon the cost to produce the service and the value of the service to the customer.

Early in 1914, the board decided to make exhaustive investigations looking to revision of the system of charges which was considered faulty—as a relic of earlier days. Four-fifths of the tonnage of ships which come to New Orleans use the public wharves, about 50 per cent exclusively, while one-third of the shipping uses both the public wharves and other facilities. This matter was made the subject of an exhaustive report to the board, which contains among many other things an interesting comparison of port charges with other ports and a discussion of the entire theory. It was developed that New Orleans was more expensive from the ship's standpoint than its competitive neighbors, Galveston and Mobile, but that when the ship and the cargo were both considered, New Orleans imposed less charges upon commerce. It was also ascertained that there was a striking difference in the dispatch rate at which vessels load and unload cargo, and it was recommended that steps be taken to bring all shipping to efficient use of the wharves, cutting down the time of occupancy and increasing the number of ships that can be accommodated. It was recommended in this report that the past system which placed the entire charges against the ships, based on the ship's size, should be superseded by a system which, while

An address presented at the second annual Great Lakes Waterways Conference, at Detroit, Oct. 28. The author, E. M. Loeb, is president of the Board of Commissioners of the Port of New Orleans.

continuing to charge the ship also charged steamship agents a rental for the area devoted to their preferential or exclusive use, and which also charged tolls upon the cargo moving to or from ships. This new system went into effect on Nov. 15 and it may be of interest to say that the railroads have agreed to absorb the charge fixed against the goods, thus obviating any change in the transportation costs to the shipper or the consignee.

All the economic advantages of a port's development may be lost by inefficient business management. Appointments to port organizations should be made with the same care as corporate appointments to positions of similar responsibility. Therefore, a civil service law is necessary in administering a public port.

Wharves and Sheds

The developed river line of the harbor extends approximately 15 miles, but there are 41.4 miles of river frontage under the control of the commissioners. The river, in this distance, is from one-half to three-fourths of a mile in width and varies in depth from 40 feet to 100 feet at the wharf lines to a maximum depth of 188 feet in mid-stream. This developed harbor has a water area in excess of 11 square miles.

Throughout the harbor there is ample depth for all requirements of commerce except that during very low water a limited amount of dredging may be required at certain wharves. There is also ample space for all vessels now using the harbor to lie at anchor in the stream and as the current is uniform in its direction, no swinging on the anchors is encountered nor has any case of a vessel dragging her anchor, except in the recent hurricane, been noted, the effect of storms being slight as compared with exposed coast harbors. Over five miles of fully developed frontage is occupied by about 4,000,000 square feet of wharves, two-thirds of which area is covered by steel sheds.

It is a matter of universal experience in any business that complete equipment for the conduct of the business means, other things being equal, enormous strides over previous results without adequate equipment. Until recently a port was considered as completely equipped when furnished with wharves and landings, now all the handling appliances used in industrial businesses, such as cranes, runways and power trucks are found in port operation.

In a report on "Transportation by Water in the United States", Herbert Knox Smith, commissioner of corporations, department of commerce,

said: "Two ports only, New Orleans and San Francisco, are noteworthy for their high degree of public ownership, control, efficiency and equipment. At New Orleans the active water front is admirably equipped and controlled by a state board; most

Annual Traffic

Port of New Orleans

EXPORTS

Cotton	\$106,000,000
Wheat	12,000,000
Tobacco	12,000,000
Lumber	10,000,000

IMPORTS

Coffee	\$33,500,000
Sugar	16,250,000
Sisal	10,800,000

The foregoing items constitute about two-thirds of the total value, but a list of the other third includes practically every commodity entering into foreign commerce.

of the wharves and sheds are open to general traffic, and a municipal board operates ten miles of belt railroad, giving co-ordination between the waterway, local industries and trunk line railroads."

The Illinois Central railroad, the Texas & Pacific railroad and the New Orleans & Northeastern railroad operate nearly two miles of wharves subject to expropriation by the state. They also operate grain elevators and handle a volume of business equal to about 45 per cent of that over the public wharves. In addition to these facilities, various private corporations

provided interesting equipment for handling freight over its docks. This consists of an overhead telfer system operating individual cars, an attendant being in each car. The system is so arranged as to load with sugar at the wharves, each car taking on one ton, depositing this load in the storehouse adjacent to the refinery. The maximum distance traveled in a round trip is 2,000 feet, and the speed of the cars is approximately 15 miles per hour.

The next important handling system in use in the harbor of New Orleans are the banana unloaders, some of which are owned by the Board of Commissioners and some by the United Fruit Co.; they are used for transferring bananas from fruit ships to the public wharves of the port. The capacity of these unloaders is approximately 2,500 bunches of bananas per hour each.

The port has used, for a long period, the Hanak conveyor, composed of a duck and rubber belt operated on rollers actuated through chain gears by electric motors. These have been employed largely in unloading coffee.

Public Belt Railroad

The public belt railroad, constructed by the city of New Orleans, in 1908 and 1909, is evidence of the fullest co-operation between the state and city authorities in developing the commercial economies of the port. It forms the economic link which binds the switching, storage and transportation facilities of the port of New Orleans into a single unit, reducing the cost of handling to a minimum and at once simplifying and solving the grave problems of transportation found at other ports and terminals. The railroad commission serves without remuneration and is appointed by the city, largely from the business exchanges. While this commission is separate and distinct from the harbor board, it works in full harmony with the port authorities. The public belt railroad has access to all public wharves and to most of the private industries of the city. It owns its engines and handles the cars over its own tracks, thus insuring equal treatment to all shippers.

In the operation of this public facility, the commerce of the city is handled at the lowest possible cost; at present the charge for switching cars from railroads to docks or industries and return is \$2 per car regardless of distance.

Appreciating an urgent need for cotton and other warehouses, specific legislation in 1913 enabled the board to further the betterment of the

New Orleans Canal

The state legislature, in November, 1914, authorized the construction and operation, within the city of New Orleans, of a navigation canal and necessary locks, slips, laterals, basins and appurtenances, connecting Lake Pontchartrain and the Mississippi river. The engineers of the Board of Port Commissioners made an industrial and economic survey to bring to light not only the best route to follow, but also all of the benefits to accrue from such facilities as well as fully covering the cost and construction phases. This canal will allow of private ownership of land and private slips for the location of manufacturing and shipping plants; will concentrate many facilities and will make possible the fullest development of local industries.

also have facilities for their particular purposes, more especially the American Sugar Refining Co., the Gulf Refining Co., the Texas Oil Co. and the Otis Mfg. Co.

The Sugar Refining company has

port, and the first large enterprise was the construction of a most modern cotton warehouse. In the latter part of July, 1914, Ford, Bacon & Davis submitted a number of designs for this development, one of which was selected, and the plan has been executed under their designs. It is a part of a comprehensive plan which may be enlarged in storage capacity, terminal trackage and wharf space. It is designed so that minimum insurance rate on buildings and contents can be obtained and is arranged to enable the plant to be operated at maximum earning capacity, and after providing the best possible facilities for receiving, storing and shipping cotton, also provides for the storage, in any vacant capacity, of coffee, rice, jute, sisal and other standard package commodities. Special facilities have been provided to permit of the receipt and handling of cotton and other commodities from vessels and their transfer to freight cars, adapting the plant to two-way operation and arrangements have been made so that flat, as well as compressed cotton may be handled and stored economically, so as to be adapted to the present methods of inspecting, weighing and classing of cotton, as well as to the proposed methods and to handle "Factor's" cotton, "F. O. B." cotton and "Through" cotton with equal efficiency.

Cotton Warehouse

Before accepting the general designs of the engineers, we considered the latest types of construction in the United States and abroad, and secured the approval of the New Orleans Cotton Exchange to plans which embodied the latest successful development. There will be yard trackage for about 2,000 cars and the plant will be capable of handling between 2,000,000 and 2,500,000 bales of cotton per annum. Within the terminal there will be nearly five miles of overhead and floor level concrete runways for the accommodation of electrically operated trucks or trains for conveying cotton through the plant. Within the compartments there will be electric cranes and specially invented appliances for pulling, pushing and grappling, which are truly remarkable in the extent to which they render service exceeding any device previously employed.

The magnitude of this warehouse could be best appreciated when I tell you that it required approximately 20 acres of roofing to cover its roofs; close to 10,000 tons of steel will enter into its construction; more than 20 miles of rail will be needed to serve it. And, if the walls were to be ex-

tended from end to end, they would reach $5\frac{1}{2}$ miles, 45 feet high.

The terminal buildings cover an area of approximately 50 acres, but including the trackage adjacent to the plant, the total area covered is approximately 100 acres. The wharves are two-story, reinforced concrete, 2,000 feet in length and 180 feet in width. The lower story is 16 feet 8 inches and the upper story 15 feet 8 inches in height. The warehouses are six in number, and, with the wharf sheds, have a normal capacity of more than 450,000 bales, with an emergency capacity of 600,000 bales.

The estimated cost per bale capacity for multiple story construc-

where, particularly in New England and abroad. The elimination of floors allows the weight of the contents of the building to rest upon the ground, making special foundations unnecessary.

This completed plant gives New Orleans a most modern warehouse system adapted to storage, handling and shipping of agricultural commodities. It is estimated that the reduction in the cost of handling and storage of cotton through the operation of these warehouses and terminal, compared with past costs, will amount to approximately 40 per cent, and the rates of insurance will be reduced to approximately one-fourth of the expense heretofore.

The owner of cotton stored in this warehouse may deliver to any ship, any railroad or any boat under practically ideal conditions. Storers of cotton will receive warehouse receipts issued by an agency of the State of Louisiana, carrying with them the moral obligation of the State of Louisiana, which will make these receipts collateral security in any part of the civilized world.

Grain Elevator

During the year ended June 30, 1915, the volume of grain handled at the port of New Orleans was over 50,000,000 bushels, and, during a part of this year, railroad-owned elevators were unable to satisfactorily handle the traffic. While these elevators are open to all railroads, the terms and conditions of service to certain roads have been unsatisfactory and have prevented them from developing a business in grain, correspondingly reducing the total volume of grain that might otherwise have been shipped through the port. These conditions were investigated by the Board of Trade, which brought the matter to the consideration of the port commissioners, with recommendations looking to a publicly owned elevator to be located on the New Orleans public belt railroad, where it would be open to use, upon equal terms, by all railroads entering the city. The Board of Commissioners, after due consideration, and after securing a report upon the matter from their engineers, proceeded to finance the construction of such an elevator, issuing \$1,250,000 of bonds for this purpose. The Board of Commissioners then instructed their engineers to prepare plans and specifications for an elevator of a storage capacity of about 1,000,000 bushels and requested the Board of Trade to appoint a committee to confer with the Board and its engineers so that, in the design of the elevator, all conditions relative

Civil Service

To select efficient employes and protect them in their positions, without influence or favor from political sources, a civil service law was recommended to the legislature and passed at a recent session. This law creates a board of examiners, appointees of the governor of the state, one to be nominated to the governor by the Cotton Exchange, one by the Board of Trade, and one by the Board of Port Commissioners. This board of examiners holds competitive examinations for all positions paying over \$75 per month, except as to samplers, weighers and inspectors of cotton, who are employed only when recommended by the Cotton Exchange. The board of examiners certifies to the port commissioners the names of three men who have satisfactorily taken the examination, and we then select a qualified applicant from this certified list. There is a probationary period of four months, after which time the employe, over \$75 in salary, is not removable except on serious charges proved before the commissioners.

tions was more than \$10, depending upon the type of construction used and the insurance requirements in relation to the construction. Through the design of warehouses adopted by the Board of Commissioners, eliminating the floors in the multiple story design, and so among other items eliminating expensive foundations and by tiering the cotton from 10 to 20 bales high, the cost of the construction is reduced to approximately \$4 per bale capacity. At least \$1,500,000 has been saved in the present development in the adoption and making practicable of the high tiering plan of storage rather than the multiple story type of storage in use else-

increase necessitated is so large that the lines complain that "competition" between them and all-rail or rail-and-water carriers not using the canal has become a myth.

Within the past three months the struggle between the all-rail, and rail-and-water lines and the all-water Panama ship lines for the coast to coast traffic became so acute that the rail carriers filed and are now awaiting decision by the interstate commerce commission on a petition to lower their rates to a competitive basis with the water lines.

There were about 375,000 tons of cargo in the vessels awaiting transit

Fix Navigation Lanes

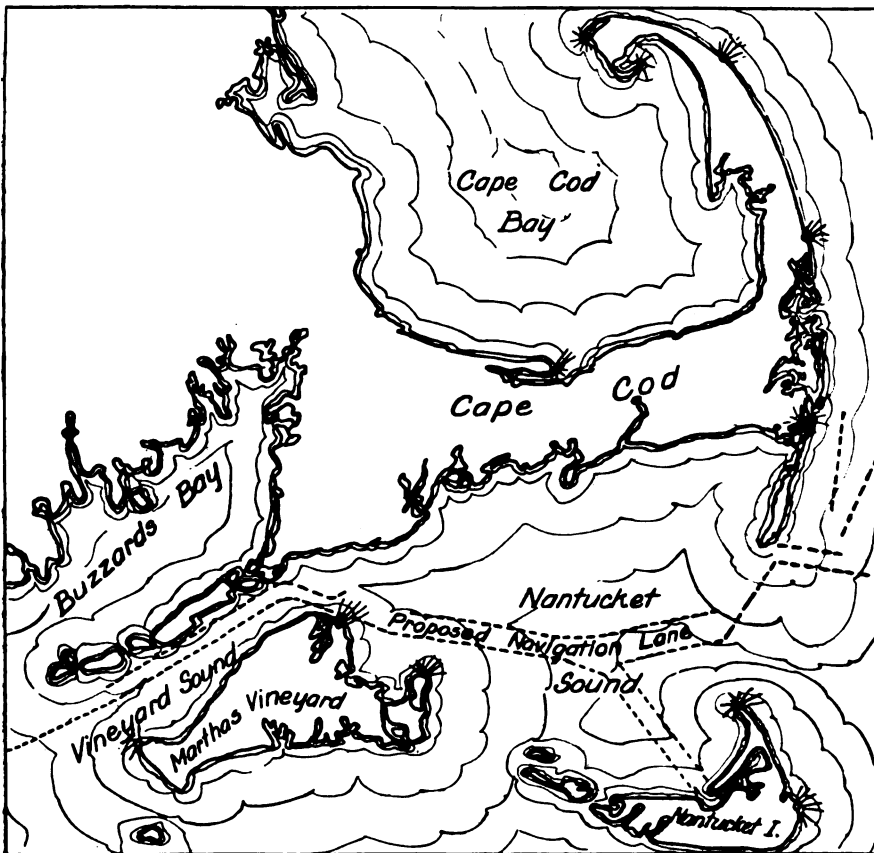
At a final conference at the chamber of commerce in Boston, Oct. 19, regarding proposed anchorage limits and clear navigation lanes in Nantucket and Vineyard sounds, Mass., it was decided to recommend that anchorage limits be laid out, under the special provision in the river and harbor act of March 4, 1915, so as to define navigation lanes through the sounds substantially as indicated on the sketch map presented herewith. This will provide for a clear course for vessels passing through the sounds and also for the vessels running between New

Chorages and clear navigation lanes. The protest was based on the contention that the proposed anchorages, etc., would soon be rendered unnecessary by the availability of the Cape Cod canal for vessels now using the sounds, and that to lay out the navigation lanes and patrol them would involve useless expense. It was the unanimous view of those present that the Cape Cod canal does not warrant deferring action to define anchorages and safe lanes for navigation through Nantucket and Vineyard sounds.

Rate War to Stop

By F. K. Haskell

Taking the initiative for the first time, in the rate war which has been going on between four companies and individuals operating freight and passenger vessels between Seattle, Bellingham and the San Juan islands, the Washington state public service commission has filed a formal complaint against the companies involved in the rate-cutting controversy. Those named as defendants include the Puget Sound Navigation Co., successor to the Island Navigation Co. which operates vessels between Seattle, Anacortes, Bellingham and the San Juan islands, making the "loop" of the sound; the Kingston Navigation Co., operating between Seattle, Port Townsend and the islands; the Inter-island Navigation Co., running between Bellingham, the San Juan islands and Anacortes, and W. H. Kasch, an individual, operating a vessel on the same route. The public service commission, in its complaint assumes jurisdiction to name a time and place for hearing. According to the complaint, tariffs and supplemental schedules filed with the commission show that the four companies are engaged in a "demoralizing rate war", which will ultimately result in poorer service. Both freight and passenger rates have been slashed, for the purpose of driving out competitors, says the complaint.



MAP OF TRAFFIC LANES AS ADOPTED

through the canal, before any of them left to go by longer routes. At the height of its activity, the Panama railroad hauled a total of 643,178 tons of through freight between the seaboards in 12 months.

Furness, Withy & Co., Ltd., have purchased three large cargo steamers for use in their new service between Philadelphia and Glasgow. All of the steamers are vessels which have been built within the last few years and are 11-knot boats. They are DEN OF KELLY, which is 4,662 tons gross and 2,999 tons net; DEN OF GLAMIS, which is 5,191 tons gross and 3,318 tons net, and DEN OF RUTHVEN, which is 4,937 tons gross and 3,116 tons net.

Bedford and the harbors of Marthas Vineyard and Nantucket islands. Recommendation is to be made that the locality be patrolled by a vessel of the coast guard, as the law contemplates, to see that the anchorage limits are observed as far as practicable, and to observe the conditions when it may be found impracticable for a vessel to conform to the prescribed anchorages. It is proposed to give the lay-out of anchorages and navigation lanes a practical test for one year, when the subject will be considered as reopened for revision.

Full consideration was given to the protest submitted by the Boston, Cape Cod & New York Canal Co. against establishing the proposed an-

Quote Rates in Dollars

"Most of the shipping agents in quoting freight rates to the orient now use dollars and cents instead of pounds, shilling and pence," said a New York exporter recently. "I have been accustomed to getting rates in sterling, so that when I asked and got from six steamship lines, rates to oriental ports the other day, and found that all their answers were expressed in terms of American money, I was rather startled. But this is evidence that the dollar has come into its own, and is probably going to be the world's standard of exchange."

Lake Ship Yards Take Many Orders

Big Revival Along Great Lakes and Contracts Already Placed Call for 1916 Delivery on 27 Vessels

By R. V. Sawhill

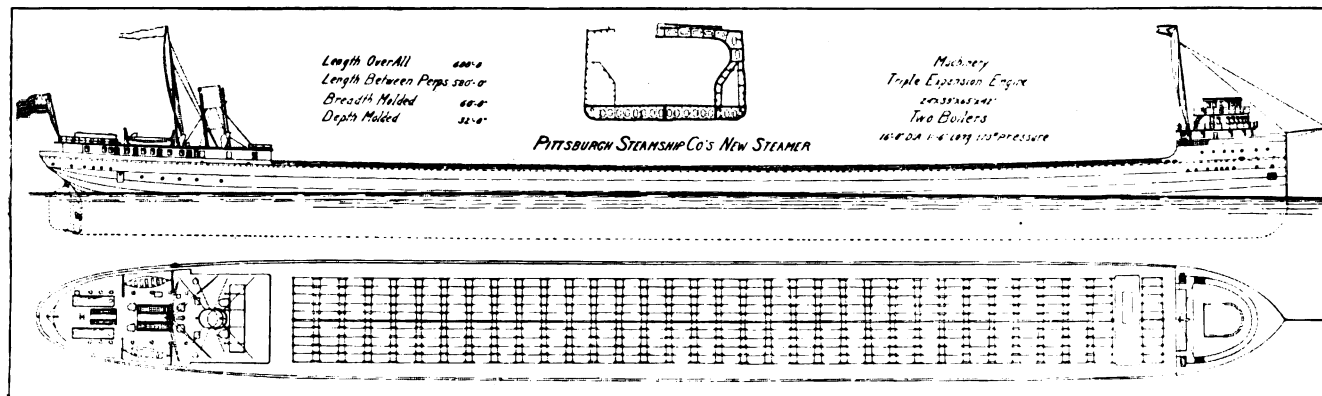
LAKE ship builders are now talking deliveries. The industry has revived with a rush and during the past few weeks sufficient orders have been taken to insure capacity operations at a number of the ship yards for the next 10 months. The new work includes a number of lake freighters coupled with an overflow of ocean going vessels that the coast yards were unable to build within the time specified by the shipping interests. The contracts recently booked by lake yards call for 27 vessels, with an approximate carry-

beam, 2 feet more than the last 600-foot freighters built on the lakes.

Of the vessels already ordered, the American Ship Building Co. has taken 10, with a carrying capacity of 57,000 tons. The Great Lakes Engineering Works has orders for eight vessels, with a carrying capacity of 42,000 tons. The Toledo Ship Building Co., Toledo, O., will build five vessels of approximately 26,000 tons carrying capacity while the Manitowoc Ship Building & Dry Dock Co., Manitowoc, Wis., has orders for four boats of 4,700 tons capacity. In addition a fire

Scotch boilers. They will be of Isherwood construction and will be built under Lloyds inspection to class A1. They will have 9-foot hatches, spaced on 12-foot centers. Their general features are shown in the accompanying illustration.

When these vessels are completed, the Pittsburgh Steamship Co. will have 23 steamers of 600 feet or over. The Interlake Steamship Co. will have a fleet of 37 steamers and two barges. Its new boat, together with the steamer W. B. DAVOCK, which was purchased a few weeks ago, will replace



GENERAL FEATURES OF NEW BULK FREIGHTER ORDERED BY PITTSBURGH STEAMSHIP CO.

ing capacity of 129,700 tons. These include five 12,000-ton bulk freighters, two additional bulk freighters for lake service, 12 Welland canal size steel freighters, four auxiliary schooners for the coast, three trawlers and a survey steamer.

To Build Ocean Boats

The revival is marked by two interesting features. Lake builders have never competed seriously with seaboard ship yards previously, but during the past year they have proved their ability to take business in any quarter of the world. The four ocean-going vessels ordered in the spring from the Great Lakes Engineering Works, Detroit, are nearing completion, one having been delivered at New York, a second is en route to that port while the other two will leave for the coast within a few days. The second feature of interest is the slight modification in the size of the new bulk freighters for the lakes. Each of these vessels will be 60 feet

boat for the city of Cleveland is being built at the Manitowoc yard.

Two of the bulk freighters were ordered by the Pittsburgh Steamship Co., Cleveland, the American Ship Building Co. and the Great Lakes Engineering Works each securing a contract for one vessel. The Interlake Steamship Co., Cleveland, and the Franklin Steamship Co., Cleveland, each ordered one vessel from the American company. The Great Lakes Steamship Co., Cleveland, placed its order with the Toledo Ship Building Co.

The five bulk freighters are all duplicates, with the single exception that the Toledo-built boat will have quadruple expansion instead of triple expansion engines. Each freighter will be 600 feet overall, 580 feet keel, 60 feet beam and 32 feet deep, with a carrying capacity of 12,000 tons. Four of them will have triple expansion engines, with 24½, 42 and 65-inch cylinders and 42-inch stroke. Each vessel will be equipped with three

ARGUS and HYDRUS, lost in the big storm of November, 1913. The Franklin Steamship Co., of which Herbert K. Oakes is manager, now owns the steamers E. J. EARLING and E. H. UTLEY. The Great Lakes Steamship Co. operates a fleet of 21 freighters.

Big Increase Over 1915

All of the lake boats will be delivered by September, 1916. Those that were ordered first will go into commission in the spring. The orders for these freighters was particularly pleasing to lake interests, as during 1915 only one bulk freighter was launched. This vessel was W. F. WHITE, which was described in detail in *The Marine Review*, October, 1915. In 1914, seven bulk freighters were launched; in 1913, five; in 1912, five; in 1911, five; in 1910, 20; in 1909, 17; in 1908, 24; in 1907, 40; in 1906, 40; in 1905, 29; in 1904, seven; in 1903, 42, and in 1902, 30. That this building program has not provided sufficient capacity to handle lake freight in

to the grain trade of the port would be most effectively dealt with.

The plant will be located on the river front, a few hundred yards from the cotton warehouse; all of the buildings will be of reinforced concrete except the galleries, which will be structural steel. The entire plant, therefore, will be fireproof and the insurance rate will be only about one-tenth the average rate now in effect at the other elevators of the port.

The working house will be entirely of reinforced steel and will consist of 47 bins with a combined capacity of 175,000 bushels. On the south side of the working house will be the receiving legs with four shipping legs on the north side, each of the legs having a capacity of from 20,000 to 25,000 bushels per hour. The elevator legs, conveyors, cleaning and clipping machines will be driven by electric motors, each piece of machinery being independent of any other.

The storage annex will consist of 60 circular tanks and 45 interstices. The capacity of the tanks is 12,100 bushels each and of the interstices 2,690 bushels each, so that the total capacity of the storage annex is 847,000 bushels, which, together with the 175,000 bushels capacity of the working house, gives a total storage capacity of the elevator of 1,022,000 bushels.

Proposed Canal

As a further port development it has been decided to construct a navigation canal across New Orleans connecting the Mississippi river with Lake Pontchartrain.

The particular advantages of this canal are as follows: It will permit commerce to move freely between the river and the Mississippi sound, and it will bring to New Orleans coal and iron from the Alabama fields at the very lowest possible cost of transportation. It will permit the commerce to be generated by the completed intercoastal canal to be assembled and interchanged in New Orleans at any sort of terminal facilities such commerce may require. It will give a fixed level water for timber basins, ship yards and all industrial plants. It will supply, through lateral extensions as provided for by law, frontage for private, as well as public enterprise to develop in any way that need may arise. It will develop an opportunity for produce markets and produce boats plying to and from farm-side throughout the fertile area of Louisiana.

A factory or warehouse located on the banks of this canal, which it is hoped to begin building in the near future, will enjoy, not only direct and

easy access to all boats, barges and ships, but quick and economic access to all railroads over the rails of the public belt railroad. This means that the industry so located will be in a most independent position insofar as the routing of raw material and finished product are concerned. The warehouses and other facilities on the river front are and will always be open to any shipper on equal terms. Similarly the banks of the industrial canal will be open to development to all industries and enterprises alike.

The business of the port of New Orleans, commencing with the decade in which its modern equipment was

both directions. This applies to both steamship lines and railroads. A port that has the imports will automatically obtain railroad service and the exports.

Any system of charges or rates of a port should relieve imports as much as practicable of transportation and transshipment costs and should particularly cater to steamship lines and independent ships, and, especially to import carriers. If care is taken of the imports, the exports, if available in the country, will take care of themselves. It may also be said that if care is taken of port costs to ships other transportation charges will take care of themselves.

River Traffic at Low Ebb

Approximately 16,000 miles of navigable rivers reach from New Orleans to the Great Lakes, Pittsburgh, Kansas City and other points, and, fan-like, the deep sea routes reach out from New Orleans to all the great ports of the world. The Panama canal brings New Orleans closer to Pacific ports than either New York or Liverpool.

The river trade of the port at present, exclusive of coal, has decreased from the enormous tonnage of the past to about 220,000 tons in 1914. The competition existing between Gulf and Atlantic ports has now adjusted itself to a railroad basis. Practically no reductions have been made in rail rates since the discontinuance of river transportation; in fact, from 1900 to 1910 there was a general increase in gross earnings per ton mile of the railroads of the United States. The Mississippi valley rail rate prevailing at present compares with the river rate of about 1900, which would have been reduced, with continued river navigation, about 30 per cent. New Orleans is thus entitled to and should receive, in the future, all the benefits of Mississippi river transportation either in reduced rail rates or in actual river service.

As stated, extensive and carefully planned harbor improvement, both in Europe and America, is a most recent development. As is generally conceded, it frequently costs as much to deliver freight in bulk or packages within port limits as to transport this same freight a distance equal to that from New Orleans to Chicago or from Chicago to New York. It is evident that this excessive tax is absolutely unnecessary and the result of past inefficient methods. A modification of these conditions within port limits may be brought about through the improvement of loading, unloading and transportation equipment of

(Concluded on page 461.)

Port Development

General port development in the United States has been stimulated by:

- 1.—*The demonstrated economies resulting from European port and harbor developments, which must in competition be established in the United States.*
- 2.—*The construction of harbor facilities in advance of trade.*
- 3.—*Competition between trunk line railroad systems necessitating individually-owned terminals.*
- 4.—*An increase in ocean transportation due to the opening of the Panama canal.*
- 5.—*The invention, improvement and use of freight-handling and transportation machinery.*

If a port is to maintain its position it must keep pace with competitive ports which, under modern conditions, means its complete development.

erected, showed an increase of 65.8 per cent for the period 1901 to 1910, over the previous decade.

New Orleans is a two-way port, the import and export tonnage being practically equal, the import movement being 46 per cent and the export movement 54 per cent of the total. This is an important advantage as the balanced movement insures the best possible freight rates in both directions. The value of the commodities entering and leaving the port averages about \$1,000,000 per day.

All the great ports are what may be termed "import ports". In the United States, at least, a port's first object should be to increase its imports. The cardinal principle of transportation organizations is to obtain for their equipment a load in

Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review

By Harry Bowne Skillman

Attorney at Law

THE liability of a steamship company for loss of baggage was in issue in case of *CELTIC*, 224 *Federal Reporter* 216, where it was held that the fact that a purchaser of a steamship ticket accepted it without reading it, or familiarizing himself with its provisions, does not enlarge his rights thereunder. He is held to the terms of the contract which he accepted, so far as those terms are not invalid as against public policy. The court held also that a provision in the ticket, which included two or more passengers, limiting the liability in case of loss of baggage to \$100, unless a higher value was declared and additional payments made, was reasonable and valid, and did not limit the entire liability to \$100, but meant that the liability to each of such passengers should not exceed \$100. In this connection the court said, "There is a well-recognized distinction between mere notices by the carrier, printed upon the ticket or otherwise given to the passenger, that the carrier will not be liable beyond a certain amount, and provisions to that effect in the contract of carriage itself. The former are not valid unless distinctly brought home to, and accepted by, the passenger; the latter, entering into and forming part of the contract, are necessarily accepted with the ticket, unless repugnant to public policy."

A vessel anchored in a harbor outside the limits prescribed by lawful authority, was declared in the case of *VERA*, 224 *Federal Reporter* 998, to be chargeable with a statutory fault, and in case of collision between other vessels has the burden of showing that her being where she was, could not have contributed thereto.

Under a charter party requiring discharge of a cargo of lumber at the rate of 35,000 feet per day, without any exception, Sundays are to be excluded from the lay days allowed, but included in the time for which demurrage may be claimed after the lay days have expired.—*Wallace vs. Cargo*, 224 *Federal Reporter* 993.

The lien of one furnishing supplies to a vessel at the request of its owner or master does not, after destruction of the vessel by fire, it was decided in *A. M. Bright Grocery Co. vs. Lindsey*, 225 *Federal Reporter* 257, attach to the insurance money, as such money is the proceeds of a collateral personal contract between the owner and the insurer and not of an interest in the vessel.

The owner of a vessel sunk in the Hudson river applying for and securing the services of the lighthouse department to mark the place of the wreck could not be held responsible for the

result of misplacing a buoy by the department, which it had no authority to move, it was observed in *Plymouth*, 225 *Federal Reporter* 483, even though it paid the department for the service.

A steamship company receiving goods from a railroad company on a through bill of lading providing for transportation by rail and water from Mexico to New York, and paying all prior charges, has a maritime lien for the freight and charges paid, according to the decision in *New York & Cuba Mail Steamship Co. vs. Maldonado & Co.*, 225 *Federal Reporter* 353, notwithstanding delivery to the consignee upon his credit or his bond.

"Vessels in motion are required to keep out of the way of a vessel at anchor, if the latter is without fault, unless it appear that the collision was the result of the inevitable accident; the rule being that the vessel in motion must exonerate herself from blame by showing that it was not in her power to prevent the collision by adopting any practical precautions." — *BANNER*, 225 *Federal Reporter* 433.

OLYMPIC, 224 *Federal Reporter* 436, decided the point that a tug engaged with others in assisting a large steamship to dock, which took a position alongside near the stern, can not recover from the steamship for injuries caused by being drawn by suction within reach of the propeller and hit, as the steamship was to be expected to use her propellers whenever necessary to aid the work of the tugs, that being customary, but assumed the risk of the position it took.

A car float attached to the south side of Pier 7 in East river, near the end of the pier, and swinging out into the river beyond the end of the pier, was held, in *ALLEMANNA*, 224 *Federal Reporter* 633, to be tied to the "exterior end" of such pier, within Greater New York Charter, providing that it shall not be lawful for any vessel to obstruct the waters of the harbor by lying at the exterior end of wharves in the North or East rivers, except at their own risk of injury from vessels entering or leaving any adjacent dock or pier.

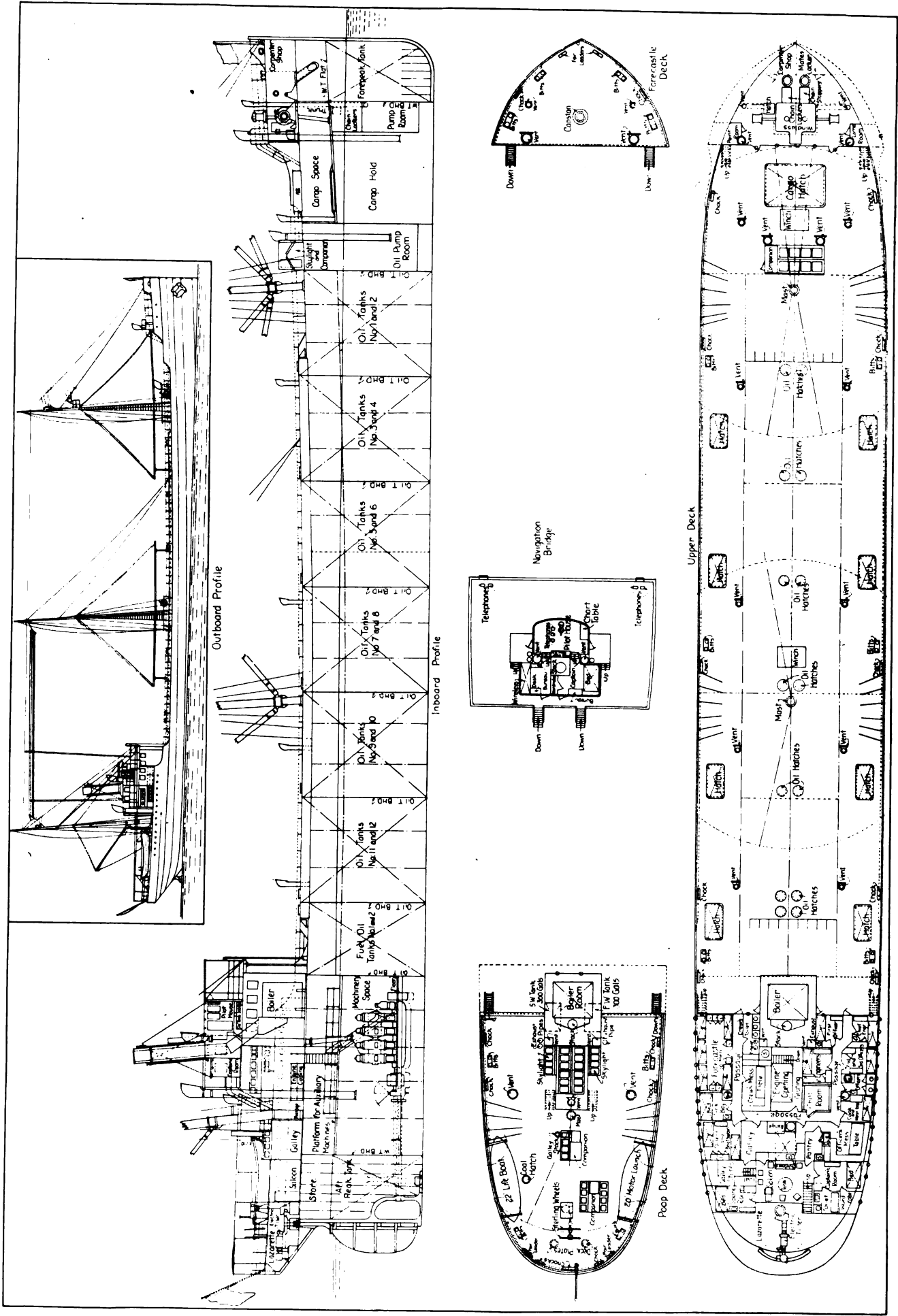
The schooner *E. STARR JONES* was held liable, in the case reported in 224 *Federal Reporter* 391, for collision with a crossing steamship for carrying her side lights in such position that the one on the side next the steamship was obscured by the sails. The court said: "While the law does not regulate just where the side lights on a sailing vessel shall be placed, it does require that the starboard light shall be so located

as to show from a point straight ahead to two points abaft the beam on the starboard side, and the port light shall show a similar arc of the circle on the port side."

"A vessel, to be seaworthy", said the court in *JEANNIE*, 225 *Federal Reporter* 178, "must be tight, staunch, strong, well furnished, manned, and victualled, and in all respects equipped in the usual manner for the merchandise service in such trade. It must be fit and competent to carry the particular cargo which it engages to carry, and able to resist all ordinary action of the sea in the particular zone of sea which it engages to sail." It was held in that case that a ship orally engaging before sailing to bring a cargo on her return voyage could not limit her liability by bills of lading delivered after loading to employees of the shipper having no authority to represent it.

Act of congress June 29, 1888, as amended by the act of Aug. 18, 1894, prohibiting the dumping of refuse in the tidal waters of the harbor of New York within the limits prescribed by the supervisor of the harbor, was held valid in *United States vs. Various Tugs and Scows*, 225 *Federal Reporter* 505, both under the police power and under admiralty jurisdiction, even though the limits prescribed by the supervisor are beyond a marine league from the shore. The court said: "Any other interpretation of the national power would render the government impotent to protect the harbors and adjacent channels and waters, which it dredges at great expense, from dumping by the vessels, which are only enabled safely to navigate by reason of this governmental aid."

The steam lighter *MORGAN*, passing down the Hudson river, overtaking and desiring to pass to starboard of the ferry boat *NEW BRUNSWICK*, gave a one-blast signal, but was answered with two blasts. She persisted however, and about the same time *NEW BRUNSWICK* changed her course to cross ahead of *MORGAN*, which then went to starboard and collided with the tug *BUSH*, also passing down. Both the lighter and the ferry boat were held in fault for violating rule 8 of the Inland Navigation Rules, providing that "under no circumstances shall the vessel astern attempt to pass the vessel ahead until said vessel ahead shall signify her willingness by blowing the proper signals," and that "the vessel ahead shall in no case attempt to cross the bow or crowd upon the course of the passing vessel." — *NEW BRUNSWICK*, 225 *Federal Reporter* 34.



INBOARD AND OUTBOARD PROFILES OF NEW SELF-PROPELLED BULK OIL CARRIERS

Lake Carriers' Stand is Approved

Department of Commerce is Pleased With Announced Intention to Obey Seamen's Law—Correspondence is Published

THE announced intention of the vessel operators of the Great Lakes to comply fully with the provisions of the seamen's law, has attracted much favorable comment. In like degree, approval is given government officials for their action in assisting operators to meet the peculiar situation caused by the law going into effect only a month before the close of the season of navigation. Inspectors are advised to consider the intent of the operator, and if satisfied that the law will be complied with, to avoid such steps as would render hardships to vessels busily closing their season's operations. To secure a clearer interpretation of the government's viewpoint on disputed provisions of the law, William Livingstone, president of the Lake Carriers' Association, and Harry Coulby, president of the Pittsburgh Steamship Co., recently conferred with William C. Redfield, secretary of commerce, at Washington.

This example of team work is further borne out by correspondence between Mr. Redfield and Mr. Livingstone, recently made public by the former. Mr. Redfield brought up the question of safe operation of ships during the closing weeks of the season in the following letter:

Will you permit me to lay before you certain suggestions on matters of deep mutual concern and to ask that you kindly give them thoughtful consideration?

If I am correctly informed, pressure upon the transportation companies on the Great Lakes is likely to be unusually severe this fall up to the very close of navigation. This will arise from the need for transporting the largest possible tonnage of ore to supply the active iron and steel industry through the winter and also from the enormous crops of the northwest, for the prompt handling of which sufficient railway facilities may not always be available.

The situation, therefore, may call for the fullest use of all obtainable vessels as late in the season as practicable.

Under these circumstances risks may be taken which would under ordinary circumstances be avoided. Under the pressure of supposed necessity cargo capacity may be taxed to the utmost and precautions may be neglected in the rush of work which may well mean the loss of life and property should a severe storm catch vessels unexpectedly during the coming boisterous weeks. I refer of course to freight vessels only.

It is not my wish to criticize in advance or to assume any purpose of neglect. In two important respects, however, the department has no power under the law to control dangerous practices if and when they exist, and it is concerning these in particular that I now appeal to you to warn vessel owners in advance of the danger that may follow if these matters are neglected.

As regards the overloading of vessels, the power of the department would end when the inspector called the attention of the captain or other controlling officer to the fact of such overloading. If, however, the captain or owner chooses, the vessel may proceed and the law can not stop her. The same is true as regards the trimming of cargoes and the stowing of goods. As to both these it may be said that the self-interest of owner and captain

would lead to taking proper care. Experience, however, shows this is not always so. Many owners, many captains, doubtless the greater number by far of both, will take care in such matters. Some captains, however, will hesitate to take the care they wish if they feel the owners are pressing them for time and cargoes. Some owners will take risks for a great stake that their own sober judgment would not approve were the reward for passing the risk less visible. In both cases the responsibility that exists toward the crew of the vessel is overlooked, and I can not too strongly urge on you that this is a grave responsibility which can not be set aside.

I trust, therefore, that you will take such measures as will bring these matters promptly and plainly to the attention of the members of your association and that your great influence will be thrown strongly in favor of exceptional care in these directions.

Mr. Livingstone's reply was as follows:

The views expressed in your letter of Oct. 7 correspond exactly to my own ideas, and I heartily reciprocate your views, and I am pleased to say also that I am sure they are reciprocated by the whole of our executive committee.

Perhaps one of the best expressions in that line, is to enclose a copy of a circular which Mr. H. Coulby, president of the Pittsburgh Steamship Co., (the largest single fleet on the lakes, comprising over 100 steamers) has sent out to his masters, which you will note reflects your views thoroughly as to safety and judgment to be used.

In this connection I desire to call your attention to one fact in connection with our lake navigation which I think will interest

you materially, and that is this, that on account of the limited draft of water in channels connecting the Great Lakes, the danger of overloading our modern ships is eliminated, and the side hoppers in the modern ships makes them practically self-trimming.

It is true, however, that we have a minor percentage of our vessels that are not strictly modern and do not have all these advantages, but on the other hand, they do not draw as much water as the larger modern vessels, carry smaller cargoes, and have all the life-saving appliances and aids to safety in navigation.

I think I am justified, however, in saying that at least 70 per cent of the vessels in our association are strictly modern vessels.

I will surely be very glad to co-operate with you in anything that pertains to safety of life, property and ship.

As a matter of fact, if we put it on cold-blooded business principles, it is the best course to pursue, and yet we are not unmindful of the fact by any means that there is something more in this world than simply dollars and cents, that safety to life comes first, and that by using every possible aid for the protection of life, we of necessity are using every possible aid for the protection of vessel and property.

In making public this interchange of letters, Mr. Redfield states that "the attitude of the Lake Carriers' Association and of the Pittsburgh Steamship Co. is so commendable that it is thought the public should be informed concerning it."

Interesting Oil Carriers

THE Baltimore Dry Docks & Ship Building Co., Baltimore, is building four steel self-propelled bulk oil carriers for the Transatlantic Motor Ship Co. These boats were designed by Cox & Stevens, naval architects, New York. The vessels are all of similar construction, their lines being shown in the illustration on the facing page. They are designed to carry 4,500 tons on 22-foot draught with a cruising speed of 11 knots an hour and a cruising radius of 8,000 miles. The vessels are being built on the Isherwood system.

The boats are of the two-deck type, with triple screw, internal combustion Bolinders engines. A Scotch boiler will be installed in the after end for heating the cargo oil and the living quarters. This boiler will be fitted for burning oil. Two continuous steel decks will extend from stem to stern and poop, respectively.

The dimensions of the vessels are as follows:

	Fect.
Length over all	306
Length between perpendiculars.....	293
Beam, molded	47
Depth, molded, to top of main deck.....	28
Draught, loaded	22

The hold will be divided by an oil-tight centerline bulkhead into com-

partments for 12 cargo oil tanks, two fuel oil tanks and two connecting pump rooms, cargo hold and bilge pump room forward with machinery space aft. Peak trimming tanks will be installed at the ends. A continuous expansion trunk will be provided between decks, the trunk extending 24 inches above the deck. Summer tanks will be provided in the wings. Eight large cargo hatches will lead into the summer tanks and one large hatch into the hold.

The design provides for a raised forecastle head and poop, navigating bridge aft, over poop, wheel house, wireless and captain's rooms on bridge. The quarters for officers and crew will be aft, under the poop deck. The vessels will be schooner-rigged with three wooden masts, staysails and trysails. Four cargo booms will be provided on the foremast, two on the mainmast and one on the mizzenmast for handling general cargo.

The vessels will be equipped throughout with electrical auxiliaries, including windlass, steerer, deck winches and cargo oil pumps. Current for driving these machines will be generated by two 60-kilowatt generating sets driven by Bolinders engines.

To Make Troy and Albany Seaports

Details of a Plan to Provide 27 Feet of Water From Eastern
End of Barge Canal to the Sea—Great Saving in Freight Charges

By Frank E. Williamson

A HEARING was held in Albany, N. Y., on Sept. 15, before Major M. J. McDonald, of the federal engineering department, to consider deepening the Hudson river between Hudson and Troy, N. Y., to 27 feet. Some 200 delegates from various cities adjacent to the Hudson river and Erie canal were present. The object of this hearing was to determine whether the army engineers shall make a preliminary survey of the river with a view to deepening the channel, thereby making Troy and Albany great inland harbors, which would relieve the congestion in New York harbor, proving of incalculable benefit to Troy, Albany and the capital district merchants and manufacturers as well as business interests of all cities located along and adjacent to the new barge canal from Albany to Buffalo.

In the event of a favorable report by the engineers, the secretary of war would take the matter under advisement and if he deemed it wise an order directing the survey would be made. The next step in order would be to have a bill drafted and presented to congress for the necessary appropriation to proceed with the improvement.

It is manifest to those who have interested themselves in the subject that by deepening the river between Hudson and Troy so as to permit ocean going vessels to dock at Albany and Troy the advantages to be gained and the benefits derived therefrom will mean much to the nation and the public at large.

The history of European canals has been that the ports on the canals enjoy practically the same water rate as the sea ports. Manchester is a notable example. As a regulating medium of all rail rates, water transportation is recognized a controlling factor and since the completion of the Panama canal, the competition for Pacific coast traffic via this route has extended as far west as St. Paul and Minneapolis, the western lines only recently having filed application with the interstate commerce commission for permission to reduce the all-rail rates on a large number of commodities to California terminals on the grounds they are unable to secure for their lines a fair and reasonable share of the traffic offered on account of the low rates prevailing via rail to New York, thence via water through the

canal to the California terminal cities. The completion of the Panama canal has decreased the distance by water to the western lumber district by about 8,000 miles and permits lumber to be delivered to the Atlantic seaports in about three weeks time, less than half the time required to bring the lumber across the continent by rail. The saving in freight rates is about \$8.00 per

A Deeper Hudson

A deeper Hudson would attract to the United States an increased movement of grain from the west and southwest which is now so profitable to Canadian ports. Albany as a seaport city would be placed 150 miles nearer to Buffalo, 71 miles nearer to Chicago, St. Paul and Duluth, 212 miles nearer to Detroit, 100 miles nearer to Cleveland than New York City. Under the present rate adjustment to and from Central Freight Association and Trunk Line territories, the rates to and from Albany are considerably less than to and from New York. Upon the completion of the barge canal commerce moving via the Great Lakes and via rail would seek the port of Albany as against New York City on account of the large saving in freight cost, to say nothing of the advantages offered in the way of increased dock and terminal facilities which Albany and Troy would have and thus obviate the congestion which now obtains at the port of New York. The rates to and from Albany are approximately 80 per cent of the rates applying between Boston and New York and Chicago. It does not require much imagination to see what an enormous sum this saving would mean to the shippers and manufacturers of the country at large.

thousand. This rate permits west coast lumbermen to sell their lumber at about \$13 base, and compete with spruce and hemlock at \$20 base, in the east. It will be seen that by deepening the Hudson river to 27 feet to Albany and Troy, this lumber can be brought through to Albany and Troy and then distributed to the interior through the barge canal and Great Lakes and by the railroads at a considerable saving to the ultimate consumer.

The waterway project is not antagonistic to the railroads; the various interests are identical, namely, to keep business in this country and not let it

be diverted to Canada through the co-operation of the Canadian government and its railroads and canals. The Canadian government and the governments of other foreign countries are expending millions upon the improvement of their waterways, while our government is lying practically idle, the amount expended for such purposes being negligible as compared with the amount appropriated by Canada and other foreign nations in the development of their waterways. Fifty million dollars is being expended by the Canadian government upon the Welland canal, increasing the depth to 22 feet to enable the largest lake steamers to navigate through to Montreal in connection with the St. Lawrence route.

It is confidently felt that if Albany and Troy are made seaport cities through the deepening of the Hudson river to 27 feet, and upon the completion of the barge canal we could successfully compete and to a large extent control the grain movement by the Great Lakes as against Montreal, as the rates would be lower than the Montreal rate, while to New York under the new conditions the rate in all probability would compare favorably with the Montreal rate. At present, due to the high all-rail rate from Buffalo to New York, we are placed at a considerable disadvantage with Montreal and we cannot hope to secure a rate all-rail east of Buffalo sufficiently low to divert the grain from Montreal to the New York port. It is, therefore, desirable that the deeper Hudson project be pushed through to completion.

Five first class passenger tickets are to be provided on each of the steamers of the Russian-American Line, sailing from Archangel to New York and return every week, for the use of wounded and convalescent Russian army officers who may be benefited by the sea trip. The offer to contribute in this manner to the assistance of the Russian army officers who have been disabled while serving their country on the battlefields was made recently by M. Benislavski, managing director of the Russian-American Line, in a letter to the Russian war office at Petrograd. The offer was accepted with thanks in a telegram received from General Alexieff, aide-de-camp to the czar.

A paper read at the Great Lakes Waterways Conference, Detroit, Oct. 28-29, 1915.

What the Government is Doing

Rulings on Marine Matters

Improvements to Waterways

Hints to Navigators

Sun Valves Show a Big Saving

THE new light marking the outer end of the west breakwater in Limon bay, is the fifth of the aids to navigation connected with the Panama canal to be equipped with a sun valve. The sun valve, acting on the principle of the thermostat, causes the shutting off of the supply of gas by the expansion of a cylinder, following the appearance of daylight. Conversely, as daylight fails, the cooling cylinder contracts and opens a valve which allows a flow of gas to the burner. A small auxiliary flame, supplied through a separate connection from the gas tank and called the "pilot flame", burns all the time and causes ignition at the main burner when the sun valve opens and after each period of darkness if the light is a flashing light, as are all of the gas lights of the canal except one at Cristobal.

Used on Larger Lights

As the sun valves cost \$135 each, they have been installed only on the larger lights. The buoys along the canal burn three-eighths of a cubic foot of gas an hour, and are lighted about one-third of the time, so that the consumption of each is approximately three cubic feet of gas in 24 hours.

The five lights now using the sun valve are the recently established aids at Cape Mala, on Bona island, and on Taboguilla island, a beacon at Balboa, and the west breakwater light. All of these are recent installations, made since the satisfactory conclusion of a test running all through the month of June, 1915, on a sun valve constructed with especial reference to the atmospheric conditions at the canal. The first sun valves sent to the isthmus were so affected by the climate as not to operate satisfactorily. Their troubles were studied and as a result the manufacturers produced a new valve, using monel metal in some of its essential parts. This metal is a combination of copper and steel and is only slightly subject to corrosion by the moisture in the air. The valve was set up at the light-

house station at Gatun and its workings were observed carefully. This is the record, by days, of its opening and closing and of the time saved by it each day:

Date.	Closed. a. m.	Opened. p. m.	Time closed hrs. mins.
June 1.....	6.44	6.33	11 49
June 2.....	6.57	6.28	11 31
June 3.....	6.46	6.25	11 39
June 4.....	7.10	6.19	11 9
June 5.....	6.38	6.28	11 40
June 6.....	6.40	6.31	11 51
June 7.....	7.03	6.35	11 32
June 8.....	7.14	5.00	9 46
June 9.....	6.47	6.08	11 21
June 10.....	7.36	6.07	10 31
June 11.....	6.38	6.10	11 32
June 12.....	7.05	6.23	11 18
June 13.....	6.41	6.27	11 46
June 14.....	6.34	6.24	11 50
June 15.....	6.38	6.23	11 45
June 16.....	7.08	6.32	11 24
June 17.....	6.34	6.29	11 55
June 18.....	6.41	6.34	11 53
June 19.....	6.43	6.31	11 48
June 20.....	6.47	6.38	11 51
June 21.....	7.52	6.33	10 41
June 22.....	7.09	6.31	11 22
June 23.....	6.53	6.28	11 35
June 24.....	6.47	6.34	11 47
June 25.....	7.36	6.44	11 8
June 26.....	7.08	6.39	11 31
June 27.....	7.03	5.58	10 55
June 28.....	7.06	4.34	9 28
June 29.....	6.53	6.38	11 45
June 30.....	6.47	5.05	10 18

The aggregate saving during the month, that is, the time when the light was not burning on account of the sun valve, was 340 hours and 22 minutes. This is equivalent to 14.18 days, or slightly over 47 per cent of the entire month. Considering the consumption of gas by the small pilot flame, which burns continuously to keep a spark for the main burner, it has been accepted as the rule in the lighthouse section that the sun valve saves 45 per cent of the gas used by a similar light not equipped with a sun valve.

The saving of gas at the west breakwater light is typical. This is a single-burner, first order light, having a lens 500 millimeters or 19.7 inches in diameter, developing 1,010 candlepower of white light and rated at 300 candlepower through the red shade. It uses $1\frac{1}{4}$ cubic feet of gas per hour of actual burning. It is a flashing light, alternating one second of light with four seconds of darkness. It flashes 12 times in a minute, which is to say it is burning 12 seconds in a minute, or one-fifth of the time. In 24 hours it would burn 288 minutes. Being

shut off, however, for 45 per cent of the time by the sun valve, the light actually burns during 55 per cent of the 288 minutes. This is 158.4 minutes, or two hours, 38½ minutes of the 24. At $1\frac{1}{4}$ cubic feet of gas per hour, the daily consumption is 3.3 cubic feet. The gas costs anywhere from 1.6 cents to 3 cents per cubic foot, and is produced at the oxyacetylene plant at the Balboa shops. At 2.3 cents, it makes the consumption of the west breakwater light come to about 7.06 cents per 24 hours, or about \$2.28 per month. On the same basis of calculation, the sun valve saves \$1.86 per month on the west breakwater light.

Open Section of Canal

Another section of the barge canal has just been put into operation. The completed section is a portion of the Cayuga and Seneca canal, the fourth branch of the barge canal system and diverges from the Erie canal near the point where the Clyde river enters the Seneca river. Following the channel of the Seneca river south, it reaches the foot of Cayuga lake and there divides, one branch continuing south for several miles until deep water in Cayuga lake is reached, and the other turning to the west and following in general the course of the Seneca river to its source at the foot of Seneca lake. In this new canal there are four locks and these do the work of 11 in the old canal. The first is located just north of the branches at Cayuga lake, near what has been known as Mud lock on the old canal. This raises the canal surface to the Cayuga lake level. The second and third locks are placed end to end in a flight at Seneca Falls, while the fourth is located at Waterloo, where the Seneca lake level is attained. It was the completion of the work at Seneca Falls that effected the opening of the canal.

As the new dam at Seneca Falls is built across the channel of the old canal, navigation through the whole

length of the canal has not been possible this season until now. Since the opening of the new section, the route has been by way of the Barge canal from Mud lock to the new flight at Seneca Falls, thence through these locks and the lake above to Bridge street, thence in the old canal to a point just above Waterloo and from there to Seneca lake through the new channel.

At only two places on the barge canal are locks located in flights of combined or tandem structures without a pool between. The best known of these places is Lockport, where two new locks replace the south tier of old locks, which consisted of two tiers of five locks each. The locks at Seneca Falls closely parallel those at Lockport, for the aggregate lift, 49 feet, is almost identical with the normal lift of those at the latter place. With a head of this amount a water power of some importance is developed.

The dam at Seneca Falls forms the canal level to the lock at Waterloo, about $4\frac{1}{4}$ miles distant. The lake created immediately above the dam is about three-quarters of a mile long and covers an area of some 50 acres. The site of this body of water is what has been known as the "flats" in Seneca Falls. Before it was inundated some 60 residences and 116 buildings which were used for commercial purposes were razed.

Some of the residents have believed that this work of construction with the accompanying demolition of property would be detrimental to the village, but since the flooding of the devastated area, it has become evident that the new lake, together with new buildings about the village to take the place of old, has beautified rather than marred the appearance and that the change will eventually be a benefit to the village.

Wire Drag Work

The use of the wire drag has revolutionized hydrographic surveying. It was, of course, realized long ago that sounding with the lead line, no matter how closely the soundings were spaced, was not an infallible means of detecting submerged rocks and boulders, and that ledges and shoals of considerable extent might be missed by the lead. This fact was emphasized by many disasters to vessels and a large number of hidden dangers became known and were shown on the chart only as the result of such disasters. Certain portions of our coast constitute a veritable ocean grave yard in which the submerged rocks are the monuments

and bear the names of the ships which were wrecked upon them.

But it was not until the method of dragging was fully developed and systematically applied that it became clearly apparent what a very large number of submerged dangers might exist even in much frequented waters and remain entirely unknown and unsuspected simply because by fortuitous circumstances no vessel of considerable draft ever happened to pass immediately over them. This applies especially to the rock-bound portions of our coasts.

It is true that the drag has been successfully used in discovering sand shoals, but it is not so well suited to work over a sandy bottom. Nor in fact is it so necessary that it should be used in such regions.

The work done on the Atlantic coast of the United States is briefly de-

scribed in a recent publication of the United States coast and geodetic survey, department of commerce, entitled "Wire-Drag Work on the Atlantic Coast", by N. H. Heck and Jean H. Hawley.

This publication gives a summary of the wire-drag work that has been done by the coast and geodetic survey on the Atlantic coast and describes the regions where such work must be done in the future to make navigation absolutely secure. It contains also an analysis of the unit costs of wire-drag work under different conditions and in different localities. Various features of our coast are illustrated and the operation of the drag is shown by diagrams.

The publication may be obtained without charge by application to the division of publications, department of commerce.

Machine Predicts Tides

A RECENT publication of the United States coast and geodetic survey contains an illustrated description of the survey's tide-predicting machine, which is now being used for the prediction of the high and low tides published in the annual tide tables of that bureau. The machine replaces the smaller Ferrel machine that has been used previously for this purpose. The newer machine is about 11 feet long, 2 feet wide, and 6 feet high, and weighs approximately 2,500 pounds. A heavy iron base supports a number of large upright brass plates. These in turn support a system of shafts, gearing, dials, and sliding frames to which are attached a series of pulleys. A slender chain on each side of the machine connects all of the pulleys and transmits the resultant motion to a system of dials and pointers on the face of the machine, where the time and height of each successive high and low water is directly indicated.

Before beginning the predictions for any station, the cranks on the sides are set in accordance with certain quantities known as harmonic constants obtained from tides previously observed at the same station. The tide is assumed to be composed of many elementary components, each of which is due to some motion of the moon or of the sun, including the changes in phase, declination and parallax of these bodies. The machine will take account of 37 such components or elementary tides, combining them into the more complex tide that actually occurs in nature.

The machine, having been set with the harmonic constants representing the components to be used, is operated by turning a hand crank which sets in motion the small component cranks, sliding frames and pulleys. On the face of the machine, time pointers pass rapidly around dials indicating successive intervals of time, a height pointer oscillates back and forth over a circular dial indicating the corresponding height of the tide, and a fountain pen, rising and falling, traces upon a roll of paper a tide curve that graphically represents the actual rise and fall of the tide. At the time of high and low waters the machine is automatically stopped by an electro-magnet, and the operator copies the time and height indicated by the dials directly in the form that is to be sent to the printing office.

To set the machine, predict, and tabulate the high and low waters for a year at any station requires from 10 to 15 hours. To perform the same calculations without the use of machine would probably require not less than six months for one computer.

The Craig Shipbuilding Co., Long Beach, Cal., has been sold to the California Shipbuilding Co. The purchasing company has been capitalized at \$5,000,000 to take over the Craig plant, it is said. Long Beach bankers are behind the new corporation. John E. Craig and George Craig, Toledo ship builders, established the Craig Shipbuilding Co.'s plant at Long Beach several years ago, immediately after the sale of their Toledo plant.

October Lake Levels

The United States Lake Survey reports the stages of the Great Lakes for the month of October, 1915, as follows:

Lakes.	Feet above mean sea level.
Superior	602.75
Michigan-Huron	579.81
Erie	571.99
Ontario	245.17

Lake Superior is 0.26 foot higher than last month, 0.02 foot higher than a year ago, 0.09 foot above the average stage of October of the last 10 years, 0.81 foot below the high stage of October, 1869, and 1.17 feet above the low stage of October, 1879. During the last 10 years the October level has averaged about the same as the September level and 0.2 foot higher

has averaged 0.3 foot lower than the September level and 0.3 foot higher than the November level.

Lake Ontario is 0.28 foot lower than last month, 0.42 foot lower than a year ago, 0.70 foot below the average stage of October, 1861, and 1.50 feet above the low stage of October, 1895. During the last 10 years the October level has averaged 0.4 foot lower than the September level and 0.2 foot higher than the November level.

The following bids were received by the United States engineer at Norfolk, Va., for dredging and rock excavation in James river, Va.: Norfolk Dredging Co., \$42,700; A. V. Wills & Son, \$42,350; Maryland Dredging & Contracting Co., \$34,590; P. Sanford Ross, Inc., \$39,134.

southeastward of Minot's ledge lighthouse, which shows that the exceedingly broken and rocky areas of Stellwagen ledges and the approaches to Cohasset harbor are duplicated in the deeper water farther eastward. This area had been previously closely surveyed by the old method with the lead, but numerous rocks with less depth than had been charted were found. A rock with 25 feet of water over it was found on the sailing line heretofore recommended between Boston and Cape Cod Canal. It lies $1\frac{1}{2}$ miles, 114 degrees true (SE. by E. $\frac{1}{2}$ E. mag.) from Minot's ledge lighthouse, in a position where 51 feet was the least depth found by the previous survey with the lead. Another rock with 21 feet over it was

"Muddling Along" Policy Causes Dilemma

ALTHOUGH shipping men and crews on the Great Lakes resolved to support the Seamen's law as soon as it went into effect last month, the irresponsibility and negligence of the government whose duty it is to place the law in operation caused much trouble and heavy monetary loss, owing to the lack of proper preparation. Between 4,000 and 5,000 men are eligible to apply for able seamen's certificates on the Lakes, under the La Follette law. Because the necessary certificates were not sent in time to the various inspectors, and because the latter were not given a long enough period to handle applications, a heavy congestion of work resulted. Crowds of sailors waited for hours to secure certificates and it is said that but a small percentage of lake vessels were fully manned according to the requirements of the law on the day it became effective. With the best work that the inspectors can possibly do, it is estimated that they will be kept busy issuing certificates until long after the close of navigation, and possibly until spring. This will make it impossible for many ships, regardless of the good will of their operators, to comply with the new law this autumn even though the examiners work at top speed. Similar conditions exist on the Pacific coast. The

collector of the port of San Francisco found it necessary to telegraph to the secretary of commerce to suspend temporarily the physical requirements of the law.

Of the 2,000 seamen sailing out of San Francisco but a small percentage appeared for certificates and of these 28 per cent were found wanting and denied certificates because of physical deficiencies. A like embarrassment in the placing of the new law in operation was experienced at Boston. The requirements include numerous tests of efficiency, such as demonstrations of life boat work, and it was necessary to divide the applicants into groups for examination on various steamers. Considering the length of time which the department of commerce has had to prepare for the execution of this law, it seems, to say the least, remarkable that preparations were so incomplete, even bearing in mind the department's brilliant and unparalleled past record for efficiency. The contrast between matters as they are and as they should be is all the more striking, in view of the fair-minded spirit exhibited by shipping men in their willingness to try out the law without shirking their share of the responsibility.

than the average for November level. Lakes Michigan-Huron are 0.15 foot lower than last month, 0.48 foot lower than a year ago, 0.75 foot below the average stage of October of the last 10 years, 3.13 feet below the high stage of October, 1876, and 0.21 foot above the low stage of October, 1911. During the last 10 years the October level has averaged 0.2 foot lower than the September level and 0.3 foot higher than the November level.

Lake Erie is 0.21 foot lower than last month, 0.07 foot lower than a year ago, 0.14 foot below the average stage of October of the last 10 years, 1.71 feet below the high stage of October, 1885, and 1.19 feet above the low stage of October, 1895. During the last 10 years the October level

Survey Waters

Federal coast and geodetic survey parties have made a complete survey this season, by means of a wire drag, of the approaches to the port of Boston and of the coast from there to Plymouth, which takes in the route between Boston and the Cape Cod canal. Numerous patches of pinnacle rocks and boulders have been found by this means. The department of commerce states with certainty that all dangers, however small in extent, will now be shown on the charts, and that shipmasters can lay a course with certainty to avoid all hidden dangers.

A report has just been received of the results of the work eastward and

found at a point $1\frac{1}{4}$ miles, 133 degrees true (S.S.E. $7\frac{1}{2}$ E. mag.) from Minot's ledge lighthouse, in a position where 41 feet was the least depth previously known.

Warning Flag

The submarine distinguishing and warning flag is hoisted on the tender or parent ship of submarines to indicate that submarines are operating in that vicinity. Launches accompanying submarines also fly this flag. The submarine warning flag consists of a rectangular red flag with white center, on which is the profile of a torpedo in black. Vessels seeing this signal should give the escorting vessel a wide berth and keep a good lookout for submarines.

Will Tilt at Windmills Once More

Though Danger of Success is Slight, Administration Still
Plans Attempt to Force Ship Purchase Bill Through Congress

By L. W. Moffett

EFFORTS to shape the legislative program at the coming session of congress, so as to compel enactment of the revived government ship purchase bill, are being pushed quietly, but vigorously. Every indication points to the fact that the administration is trying to discover the best ways and means to jam the measure through. It seems certain that no specific plan has been devised, and perhaps none will be suggested until conferences have been held with prominent Democratic leaders in the house and senate, including Chairman J. W. Alexander, of the house committee on merchant marine and fisheries, and Senator Duncan U. Fletcher, ranking member of the senate committee on commerce, the chairman of which, Senator James P. Clarke, of Arkansas, was one of the seven Democratic insurgents in the upper house who opposed the measure.

Revival is Surprise

With the defeat of the bill during the last congress, when it was filibustered to death in the senate; with the overwhelming opposition to the measure expressed in the referendum taken last summer by the chamber of commerce of the United States; with the almost universal condemnation of the plan in marine, commercial and financial circles generally, and, last but not least, with a more urgent need now than ever for a constructive merchant marine policy to relieve what President Wilson has characterized as the country's "constricted and dammed up" trade, it has been the prevailing opinion until recently that the government ship purchase bill, with its state socialism features, had been abandoned. An apparently well founded hope existed that the administration would not again attempt to introduce the bill, but would instead co-operate with private and practical merchant marine interests to revise the navigation laws, as well as to amend or repeal the seamen's act so that a privately-owned merchant marine would be built up. On the contrary, however, every discouragement has been offered the upbuilding of such a merchant marine. It was not to be expected

that the administration would permit any form of subvention, because the platform on which it was elected specifically opposes that plan, despite the fact that it is the one favored by the great maritime nations. While many planks in the Baltimore platform have been badly splintered or dry-rotted, the one relating to opposition to subventions has remained intact.

Administration supporters in congress are known to have been ready to outline plans for the building up of a merchant marine, which had at least a few practical features, and

Uninviting Prospect

Carefully and unemotionally analyzed the chances that the Democratic administration will be able to inflict its noxious ship purchase bill upon an unwilling nation seem slender at present. Eventualities may of course develop, which may upset the calculations of the political seers; but the attenuated Democratic majority at the next session, and the obvious dislike of the people and their representatives for a program committing them to a half-baked state socialism, are sure to prove formidable factors.

which could have passed congress, it is believed, without any strong opposition. Now, however, since Secretary of the Treasury William G. McAdoo has inaugurated a campaign for enactment of the government ship purchase bill, these administration supporters in congress are evidently holding back and waiting for suggestions from the President before doing anything.

Mr. McAdoo, who recently opened his publicity campaign in favor of the ship purchase bill in Indianapolis, is carrying on a vigorous propaganda. Copies of his speech are being mailed out to the press and to every individual whom it is thought may be interested. At the same time, Secretary of Commerce William C. Redfield takes occasion, now and then, to "boost the stock" of the ship purchase measure, which likewise has been touted by Secretary of the Navy

Josephus Daniels, together with the latter's proposal for the erection by the government of an armor plate plant and a projectile plant. This trio, known as the triple entente of the Wilson cabinet, is thought to be attempting to sound public sentiment toward the measure, feeling, perhaps, that while such sentiment has been distinctly hostile toward the plan, a change may latterly have taken place. Should the administration be convinced that the public is utterly opposed to the scheme, it may possibly be given up. The fact that the President and particularly these three cabinet members are so extremely desirous of having the measure passed will, it is believed, blind them to the real sentiment of the public. In other words, the bill will be pushed to enactment if this is at all possible.

Measure Can Be Blocked

With the Democratic majority in the senate to be increased at the next session, there are those who fear the bill will pass the upper house. Among those sharing this view is Senator Smoot, of Utah, Republican, bitterly opposed to the measure. However, his opinion is not shared unanimously by all those who have studied the situation. Some think that, even though the filibuster might be renewed with success in the senate to defeat the bill, this plan will not be used. It is evident that the administration and its supporters in the senate fear the filibuster because of the attempt being made by them to pass a cloture rule in the senate to limit debate. It is not thought such a rule will be adopted, but even though it were, parliamentary tactics would still be available to make passage of the measure decidedly difficult. Six of the insurgent Democrats remain in the senate. Granting that the bill passes the upper house, the situation in the house of representatives at the next session will be entirely different from what it was at the last one, when the measure passed the lower body. At that time the Democrats had a majority of more than 140. At the coming session the Democratic majority in the house will be but 29. Postmaster General Burleson, as field commander of the administration's

forces for the house, has already held conferences, it is said, with Representative Pou, of North Carolina, ranking member of the house committee on rules, as to the best way of forcing the administration's legislative program through the house next winter. Later conferences are expected to develop concrete plans. Certain it is that administration leaders are worried over the house situation. With their majority reduced to its present size, the balance of power rests in the hands of any 10 or 15 members who choose to take it. It is said that a great many Democrats in both houses voted for the measure at the last session through fear of the administration's power. With its authority cut down so much in the house, however, Democratic disaffection may be expressed against the measure. Moreover, the gag rule which was applied so easily at the last session cannot readily be employed at the next session, because the Democrats will not have the two-thirds majority vote necessary to put it through. As the house is made up of 435 members, it may be observed what a forcible filibuster could be conducted by this large membership, if the gag rule is not applied. It is not known that the Republicans would filibuster to defeat the measure, but it seems a comparatively safe prediction. So, all elements considered, the measure's defeat, if it is reintroduced, seems probable.

May Attempt Rider Scheme

There have been reports that the administration will tack the ship purchase bill onto the naval appropriation measure, making capital out of the popular agitation for an adequate national defense, so as to force the ship purchase bill through. All appropriation measures must originate in the house, and, as the defeat of the ship purchase bill is believed to be most probable at the hands of that body, the measure may not be incorporated in the appropriation bill when the latter is introduced in the house, but may be submitted as an amendment to that bill when it is in the senate, chances being taken on its being ruled out on the point of order that it is new business. Passage of the measure in the senate—assuming that to be possible—may be used by the administration as a club, compelling house conferees to accept it and to try to force it through the house. But this form of log rolling does not look promising.

A report is also current that President Wilson is ready to accept compromises on the ship bill. These com-

promises, which might embroil otherwise satisfied Democrats in the house and senate and force their opposition, are said to be:

First, a provision defining the specific object of the measure as the development of trade with the Latin American countries, or, at most with the Latin American countries and the orient, thus insuring against government competition with other American lines.

Second, a provision that the government shall not permanently engage in the shipping business, but that when trade lines are fully established, the government shall withdraw.

Capitalize National Defense

The proposed shipping bill, as outlined by Secretary McAdoo at Indianapolis, is virtually the same as the old measure. He took occasion, however, to suggest that the ships, which should be built by both private interests and the government, be used as naval auxiliaries, declaring the government needs that kind of craft to the extent of 1,172,000 tons. From this, it is believed, he hopes to connect the bill with the national defense program. Public opinion is so strongly in favor of national armament, however, that if the plan for national defense is held up or delayed by reason of the ship purchase bill, it is believed that the administration may be compelled to abandon the latter project, which is contrary to all principles of the government in the past, while national defense is its first duty.

Mr. McAdoo's blithe remarks as to the placing of orders for proposed government controlled vessels with ship yards along the coasts and great lakes, has excited a great deal of interest. It is pointed out that he revealed utter ignorance or disregard of facts. Shipping interests have not only shown that all ventures of the government in the operation of transportation lines had failed, but have suggested the virtual impossibility of obtaining the ships desired. They have recited the well known fact that large vessels are not to be had, and that prices, which have doubled since the war started, are certain to go higher. Moreover, it would require at least 22 months to build suitable vessels. Meanwhile the navy yards are busy with government work. The secretary also overlooked the fact that private ship yards are taxed to their limit, and he failed to explain how ocean going vessels built on the Great Lakes would get to the coasts. The secretary did not indicate knowledge of the fact that new tonnage built in American ship yards in the last five

years has amounted to considerably more than 1,172,000 tons, the amount necessary for naval auxiliaries, according to him. In the four years preceding the present it aggregated 1,186,243 tons, and in the present year it was approximately 300,000 tons. At the present time the United States has a commercial marine in excess of 8,000,000 tons, which is more than any other two nations in the world put together, excepting Great Britain. Passage of a ship purchase bill, such as is proposed, would be a smashing blow to the prosperity of this industry.

It seems strange, when the situation in congress is analyzed, that the administration appears to think it can pass the bill. Representative Claude Kitchin, who becomes majority leader of the next house, is said to have told President Wilson at the last session of congress that if the measure did not pass at that time, it never could pass. There is no reason to think Mr. Kitchin holds a different view now from the one held then.

A Strange Hallucination

It seems remarkable, too, that the administration thinks the government can do what private enterprise cannot do; that is, make the more expensive service compete successfully with the less expensive, or run a business at a loss, the deficit to be made up by taxpayers of the nation, among whom are ship owners whose business had been crushed by government competition—a competition, by the way, which is unfair, because overhead charges, depreciation and similar items are nothing to a government project, losses being recovered by taxation.

Unless present indications change completely, there is little hope under this administration for the upbuilding of the American merchant marine, so exceedingly necessary at this time. There is nothing but a prospect for the destruction of what chances there were for the building up of such a fleet.

If it is at all possible, industrial, commercial, financial and marine organizations throughout the country ought to concentrate their efforts and bring such pressure upon the administration and congress that all ideas of reintroducing the fruitless ship purchase bill should be abandoned at once and plans be made for the building up of a merchant marine along safe and sane lines.

The Luckenbach Steamship Co., New York, has leased the Hamburg-American Line pier at the foot of Thirty-third street, Brooklyn, until the end of the war.

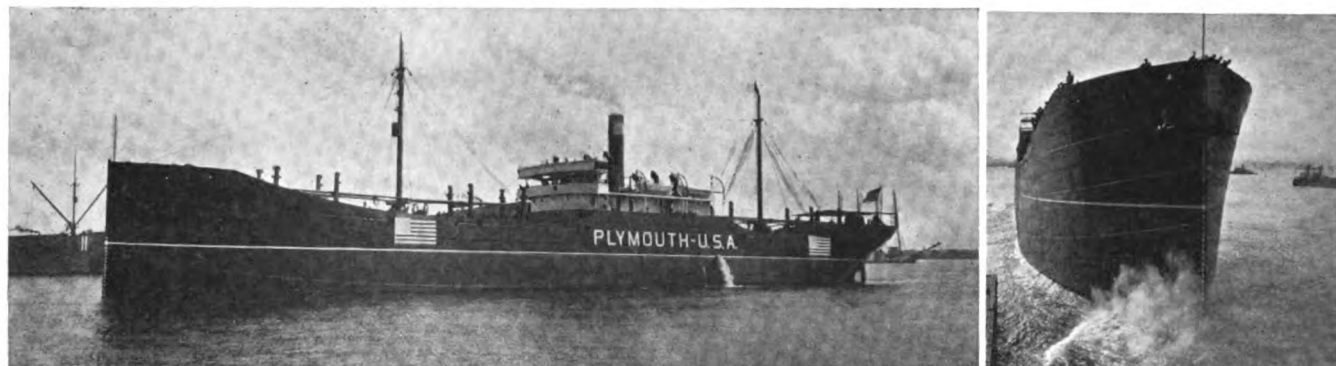
Photographs From Far and Near

Contributions For These Pages Are Solicited



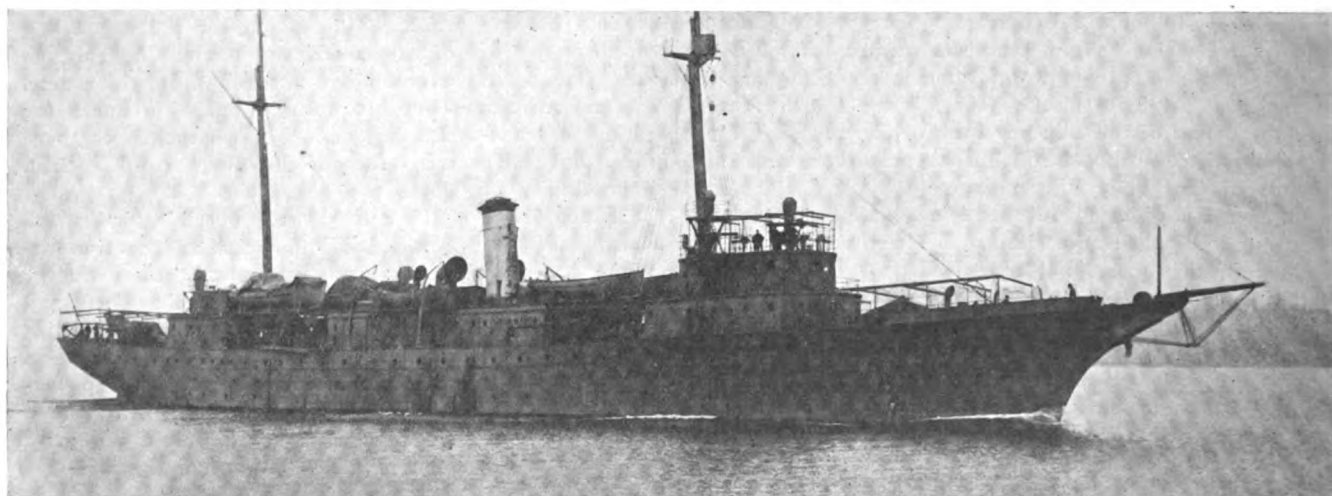
MEMBERS OF GREAT LAKES WATERWAYS CONFERENCE WHO ATTENDED

The large lake transportation companies, the principal industries whose prosperity depends in a large measure on shipping facilities, the executive to maritime commerce were ably discussed, the topics including, "The Importance and Influence of Lake



A POSSIBLE FUTURE ADJUNCT TO OUR GREATER NAVY

It is in the upbuilding of a strong merchant marine that this country will see its hopes of an adequate navy realized. Dreadnaughts are useless without accessory ships such as colliers. PLYMOUTH, whose launching is illustrated in the smaller view, is the eighth of the fine coal-carrying fleet built by the New York Ship Building Co. for the Coastwise Transportation Co., Boston. She is 395 feet long, 55 feet beam, with a 26½-foot load draught. Engines of 2,000 horsepower drive the big collier at a speed of 11 knots per hour. She is fitted with self-unloading machinery amidships



A FOSTER MOTHER FOR UNCLE SAM'S SUBMARINES

Built by the Seattle Construction & Dry Dock Co., Seattle, this speedy vessel is designed as a tender to the nation's undersea fighting craft, being completely equipped as a self-sustaining supply and repair ship. In addition to powerful winches, windlass and towing engine, her "cable ship" bow is fitted with a 30-ton lifting gear worked by the anchor engine. The ship, which is 350 feet long and 54½ feet beam, was christened BUSHNELL, in memory of the American inventor of the submarine. She carries a complement of 19 officers and 300 men and is driven by Parsons turbines of 2,500 horsepower

Latest Marine News in Pictures

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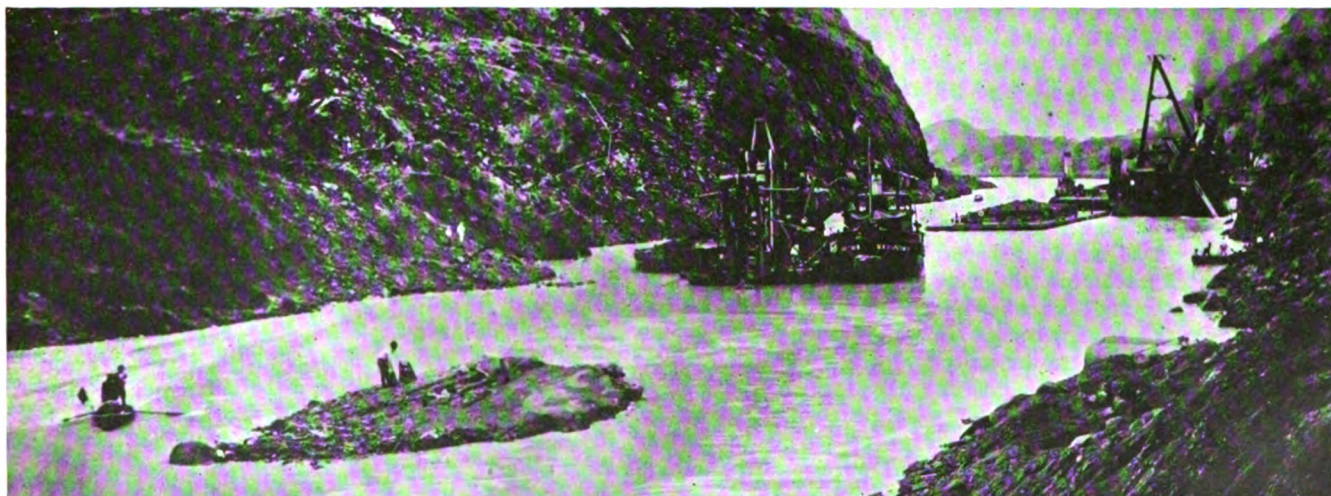
ITS SECOND ANNUAL MEETING, HELD AT DETROIT, OCT. 28 AND 29, 1915

bodies of important ports, and other influential organizations were represented at this interesting conference. Problems of present day significance Commerce," "Port Facilities for Loading and Unloading Freight," and "The La Follette Seamen's Act."



THE BUSY SEASON IS ON FOR THE AMERICAN SHIPWRIGHT

This illustration of the waterfront at the plant of the Baltimore Dry Docks and Ship Building Co., Baltimore, reveals the activity which has developed as a result of the world-wide shortage of carrying tonnage. In addition to building a number of oil tankers, dredging craft, and other vessels of various types for foreign and American buyers, this big yard is rushing repairs on a long list of ships from every corner of the world



AN UNWELCOME ADDITION TO THE NATION'S ISLAND POSSESSIONS

Courtesy of Literary Digest.

Owing to the tremendous pressure of sliding earth and rock on the sides of the Culebra cut in the Panama canal, a mound has been forced up directly in the center of the waterway. In spite of the fact that powerful dredges are working night and day, moving more than 200,000 cubic yards of material every week, it may be months before the "Big Ditch" is once more open to traffic

Port Problems of the Great Lakes

An Analysis of Factors Governing Harbor Improvement at Important Lake Points—Need for Better Facilities Evident

By William George Bruce

President Milwaukee Harbor Commission

THE commercial enterprise and engineering ingenuity which has found expression in the modern ship traversing the Great Lakes has not been met with equal enterprise and forethought by the port cities harboring these vessels. While the modern ship minimizes in its construction the dangers of the open sea, carries its cargo in maximum quantity to meet the commercial demands, and is administered with efficiency and reasonable safety, it frequently meets, in port, with insufficient, obstructive and unsatisfactory service. The problems of the Great Lakes are confined in the main to the port cities, and have grown out of the newer conditions that are attending water-borne commerce. In short, the port cities have not entirely kept pace with the evolution of the lake vessel.

Therefore, the problem which stands out most prominently and which covers a large number of lake cities deals primarily with deeper and wider river channels and increased terminal facilities. The constantly increasing size of vessels has rendered the inner harbors of many cities either partially or entirely inaccessible as far as the larger vessels are concerned.

Terminal Facilities

At the same time the opportunities for terminal facilities have been lessened or become inadequate. Commercial and industrial enterprises which have clustered near the rivers and channels of port cities have rendered the available water frontage inaccessible or too costly for transportation purposes. This has become particularly true where business streets have paralleled the rivers and where the business traffic on street fronts has outstripped the transportation traffic on water fronts. Thus shipping warehouses in a number of port cities have been crowded from the more accessible to remoter and less accessible locations where the channels lack in depth and breadth, and where the movements of vessels becomes more difficult and expensive.

Chicago proclaims, "The greatest need is for an unobstructed 200-foot channel in the Chicago river". Milwaukee says, "Give us more terminal facilities accessible to larger vessels". Buffalo wants a wider channel entrance; Cleveland wants a straighten-

ing and widening of its water course; Oswego wants greater depth; Rochester wants straightening of river bends and deepening to accommodate large craft; Toledo and Sandusky are striving for a maximum depth and Erie is fighting shallow waters. And so we find nearly everywhere a demand for physical conditions that will meet a constantly changing lake commerce. Closely allied with the demand for

nections and terminal facilities are contemplated. Chicago has acquired a large strip of lake frontage which is to be improved at a cost of some \$4,000,000 for outer harbor purposes. The plans contemplate a rail and water exchange center. Ashland wants to own a municipal dock and to equip it with a warehouse that shall be publicly controlled.

Detroit says, "Our greatest requirements are the possession of municipal docks and wharf sheds where independent boats may handle cargoes, and through belt line tracks to the docks". Cleveland voted Nov. 2 on the transfer of one mile of lake frontage from railroad to municipal ownership. "The possession of this land now controlled by the railroads will enable development that has hitherto been impossible". Rochester wants public dock facilities. Manitowoc says, "This port needs most a public warehouse and dock with municipally owned tracks". Duluth says, "What we need most would be municipal docks electrified and equipped for handling merchandise freight". Toronto wants additional modern docks and freight sheds and proper co-ordination of rail and water transportation facilities.

Some Commercial Aspects

While this report aims to deal solely with the physical aspects of the Great Lakes problems there are commercial considerations which, no doubt, come properly within the province of this discussion. In this connection Duluth says, "Our lake port's greatest problem is the independent operation of lake carriers of merchandise and the consequent construction of lake rates entirely independent of any comparison with the rail rates and only on the basis of actual lake cost of operation plus a profit. If we could get this firmly established, and this principle of rate making on the lakes, the lake cities will become the distribution points which they deserve to be and would reach far more into the interior than is now possible under the present rate structure". Along the same line Erie says, "The greatest problem in connection with our lake port is the securing of through rates such as are in use at Buffalo and Cleveland. For example, the rate via water from Erie to Chicago is 10 cents

Careful Study Made

In the preparation of this paper, which was presented at the recent Great Lakes Waterways Conference at Detroit, data were collected from the principal ports on the Great Lakes including Chicago, Milwaukee, Manitowoc, Green Bay, Racine, Kenosha, Duluth, Superior, Marquette, Ashland, Detroit, Bay City, Port Huron, Buffalo, Cleveland, Toledo, Erie, Ashtabula, Dunkirk, Sandusky, Oswego, Rochester and Toronto. A series of questions was submitted to the authorities of the several ports and the opinions and conclusions advanced in the article are based on an analysis of the replies received. The questions submitted were as follows:

1.—What do you deem the greatest problem in connection with your lake port? What does your port need most?

2.—Does your local government extend the desired aid to river and harbor improvements?

3.—Is there adequate co-operation between the local and federal authorities in securing needed improvements?

4.—Who serves as the intermediary between your city government and the United States Engineers' Department?

5.—How do you raise money for dredging and docking—by bond issue or by direct tax levy?

improvements that shall facilitate the movement of vessels in the inner harbors of lake cities is the need for more adequate terminal facilities. This need is so generally recognized that the local authorities in many cities are striving to secure available water fronts to be developed for terminal purposes. Milwaukee is acquiring a peninsula, which lies between the lake and one of the rivers, covering a distance of one mile, to be developed at a cost of several million dollars into an outer and inner harbor. Rail con-

per 100 pounds and via rail is 12 cents per 100 pounds. Grain moved all rail secures the benefit of through rates by means of a milling-in-transit privilege, while grain arriving via water does not. The milling-in-transit privilege is granted in Buffalo for grain arriving via water and the result is that, so far as the moving of grain to the east is concerned, we might just as well not be on the lake. By this I do not mean that no grain moves through this port, because at times of congestion at other ports it does. We are, however, prevented from building up a milling center by the absence of the privilege named". Toronto believes that shippers do not sufficiently appreciate the advantages derived for the transportation of merchandise by water as compared by rail during the navigation season of the year.

The question whether the several local governments extend sufficient aid towards carrying out necessary harbor improvements was almost uniformly answered in the affirmative. The municipal authorities are apparently satisfied with the part they are playing in promoting lake commerce.

The fact that every lake port is grappling with unsolved problems and crying loudly for imperatively necessary improvements would indicate, at least, that there is an inconsistency between statement and actual condition. It is true that the several municipalities are engaged in meeting recognized needs. But it is equally true that these needs were slow in receiving recognition, and that there has been an absence of timely anticipation of future needs.

It has developed that municipalities have not always been backed by a wholesome public sentiment in recognizing immediate and prospective harbor requirements, that the official machinery has frequently been hampered with inefficiency, that the process for obtaining appropriations is often times cumbersome and slow, and that the administrative arm is not always vigorous and expeditious.

The modern municipality has many legitimate demands upon its treasury. But, it does not always distinguish between the necessary and the merely desirable; between the things that make for material progress and those that cater to the pleasure side of life. They fail to recognize that a row of business blocks, a group of factories, a train of freight cars and a fleet of ships precede a park, a boulevard, a monument, or a zoological garden; that one must earn the cost of the other, and that government, be it local or national, must encourage commerce, trade and industry as well as foster the civic and cultural activities of a people.

Then, too, it must be admitted that there has been a tendency on the part

of lake cities to rely more largely upon federal government aid than upon their own initiative. The public does not always realize that government action is predicated or contingent upon actual or probable commercial needs and a reciprocal compliance on the part of the municipalities with certain conditions.

At most lake ports the intermediary between the city government and the United States engineers consists either of the municipal authorities or the local commercial organization. The commissioners of public works or aldermanic committees, or sometimes committees representing commercial bodies serve as the connecting link between the local and national governments. The local records and data covering the history of the port commerce and of harbor conditions are frequently kept in a fragmentary and disconnected manner.

The factors, therefore, that serve as the intermediaries between local and national government are sometimes transitory in authority, unfamiliar with the history of the local harbor conditions and inexperienced in what constitute the most utilitarian improvements. There is frequently a hazy conception as to where local government obligation begins and where federal government obligation ends. Thus, if the harbors on the Great Lakes are not developed to the highest possibilities of useful service it is, in part at least, due to disconnected and spasmodic effort on the part of local authorities.

Deductions and Conclusions

The problems of the Great Lakes, physical, administrative and economic, must find their ultimate solution in the realization of the following factors and conditions:

First.—Public sentiment in port cities should stand ready to render adequate financial support to all needed harbor improvements. The demands of local government are in many instances manifold and pressing. Harbor needs are frequently minimized, inadequately urged and not accorded the popular recognition they deserve.

Second.—The deepening, widening and straightening of inner harbors, rivers and channels to accommodate a modern lake commerce is necessary. The accomplishment of these improvements should be urged upon broad and liberal lines recognizing the reciprocal relations between port cities as well as their mutuality of interest, and the material gain ultimately to be derived for the locality as well as the nation at large.

Third.—Terminal facilities that will provide conveniently accessible docking and the expeditious discharge of cargoes are required. If water transportation is to be developed to its highest possibilities it must be provided with conditions that observe economy of time,

effort and substance. Terminal facilities are as essential to water transportation as they are to land transportation.

Fourth.—Commercial enterprise should awake to an appreciation of the advantages of water transportation and avail itself to the fullest extent of its services. It is within the possibilities of water route shipping to accommodate a large variety of commodities as well as a great tonnage. The economies to be achieved must primarily come into greater recognition at the hands of the shipper.

Fifth.—Such governmental regulation as will adjust the rates for both land and water borne commerce, eliminate discrimination, and ensure a reasonable compensation for the service rendered should be urged. There should be developed a better co-ordination between land and water traffic in order that the Great Lakes may serve the commerce of the nation most advantageously.

Sixth.—It is essential to have an intermediary between local and national government that is alert, energetic and efficient. Such intermediary should not be exposed to local administrative changes and upheavals, but should consist of a body of men chosen because of their character as citizens and their knowledge of harbor affairs, with reasonable tenure of office or continuity of service.

The accomplishment of the objects and purposes here enumerated involves the dissemination of intelligence which must be extended to all port cities. Not only must each municipality be brought to the realization that it must bring its own port up to the highest stage of efficiency, but that each port is concerned in the efficiency of every other port. If the inadequacy of one port reduces the lake tonnage by one cargo then some other port is surely affected. A shipping port necessarily means a receiving port. Thus, the interests of the port cities are mutual and reciprocal.

The Great Lakes Waterways Conference should become a great educational force that can send its message into every population center, arouse an appreciation of the services rendered by the Great Lakes to the economic welfare of the nation, send light and instruction into every port city, and awaken a high sense of duty in developing one of nature's most marvellous waterways to the highest service of man.

San Francisco news dispatches state that the Alaska Steamship Co. paid the Union Iron Works \$325,000 for the steamer KANSAS CITY, which is to be placed in service between Puget Sound and Alaska. The vessel formerly belonged to the San Francisco & Portland Steamship Co.

A Double-Ended Motor Ferry Boat

Ramon is Driven by Large Gasoline Engine
of Electric Ignition Type—Details of Design

By Charles J. Belden

AT A TIME when large diesel engines are attracting so much attention, it is noteworthy that an internal combustion engine of the electric ignition type should be built in a size approaching that of the propelling machinery of the large motor ships. This engine, which was built by the Union Gas Engine Co., San Francisco, has been installed on the motor ferry boat RAMON.

The marine motor in large, as well as small sizes, has come to stay and this type of power is receiving the close attention of marine engineers. The success and economy of large oil-engined vessels has been established beyond question and the prejudice against the gasoline and oil engine of the electric ignition and diesel types that had long been held by ship owners, has been largely dispelled.

The motors first installed could not always be relied upon to start up at short notice. This was brought about often from ignorance of the motor itself, the weakness of ignition and the inability of the engineer to swing the larger types of engine. These difficulties have now been overcome. In addition, the general knowledge pertaining to the internal combustion engine has become a part of every-day existence. The development of the

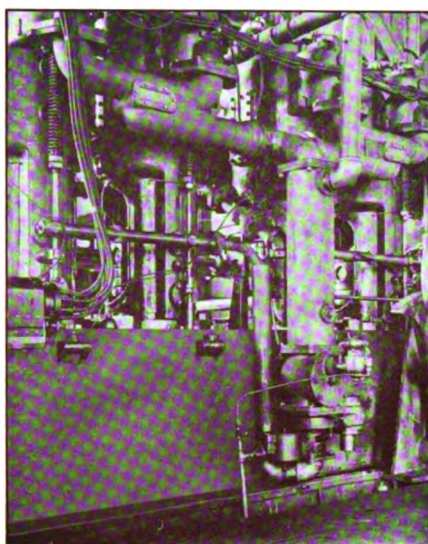


FIG. 2—CARBURETOR AND EXHAUST HEATED INLET MANIFOLD

internal combustion type of engine is well known even to the layman. RAMON is shown in Fig. 1. She is a double-ended steel, railway ferry boat, propelled by an eight-cylinder gasoline engine of 600 horsepower. The engine is of unusually massive construction, weighing approximately 120,000 pounds and measuring 45 feet in length.

RAMON is constructed entirely of

steel and is utilized to ferry passenger and ferry trains across an arm of San Francisco bay. She was designed and built by the Oakland, Antioch & Eastern Railway Co., and her successful operation has been watched with considerable interest by Pacific coast engineers.

The most noticeable feature of the hull, which measures 236 feet over all and 58 feet beam, is the absence of curved plates and the adoption of a box-like design with ends that are extremely flat in order to present a large area of displacement to obviate tipping when loading or unloading cars. There are two longitudinal bulkheads running the entire length of the vessel, forming a central girder which gives extreme rigidity to the hull. Four transverse bulkheads across the full width of the boat divide it into 11 watertight compartments. The pilot house is supported by steel towers, at the base of which are the deck houses. A pneumatic steering gear controls a balanced rudder on either end. Wooden decking laid over the steel deck plates insures the safety and comfort of the passengers in transit. There are three tracks on the main deck, each 220 feet in length, having a total capacity of nine cars. The arrangements for propelling



FIG. 1—FERRY BOAT RAMON WHICH IS DRIVEN BY A 600-HORSEPOWER GASOLINE ENGINE

RAMON are rather unusual for a motor-driven craft, although the same scheme has been used for steam vessels of similar character. The engine is set amidships, and is coupled to a propeller at each end, through friction clutches. As the two propellers are of opposite pitch, the direction of the boat is controlled by engaging either one clutch or the other, thus eliminating all necessity for reverse gears, or making the motor directly reversible.

This installation possesses unusual interest, from the fact that the propelling machinery consists of what is said to be the largest distillate or gasoline engine ever constructed. This unit operates at a normal speed of 210 revolutions per minute. In this engine, the cylinders are cast sep-

are cooled without the complications consequent to the circulation of water through a moving member.

The cylinders are of the T-head type, with valves on opposite sides, operated by plungers and tappets off separate camshafts. Notwithstanding the high power of this engine, the whole construction is simple, and is merely an enlargement of one of the smaller sizes.

Starting is accomplished by means of compressed air, which is delivered to four cylinders through a distributing valve. There is also a compression releasing gear fitted to the exhaust valves for use in case the engine is "barred over".

Lubrication is effected by four mechanical force-feed oilers positively

distillate engines in this type of boat will be readily appreciated when it is considered that the engine room force will consist of one engineer only. The greatest saving, however, is the elimination of fuel expense while the vessel is tied up in the slip between runs.

Port of New Orleans

(Concluded from Page 446.)

the port, such as industrial motor roadways, motor cars, belt railroads, lateral canals, and handling machinery. The greatest strides in this respect have been made in foreign ports, particularly those of Germany. Among the American ports most advanced in commodity handling machinery and efficient belt railroads for the transfer, transshipment and movement of car freight, and roadways for the use of heavy industrial motor cars along the wharves and water front, is the port of New Orleans. It is safe to assert that complete modern port equipment will enable a port so equipped to transship freight at about one-half the cost incurred in ports without this equipment. This does not include the ship's time in port, but merely the cash expenditures incurred. An average modern ship, including operating expenses, depreciation and fixed charges, has a running cost of \$250 to \$500 per day. If, by complete port equipment, three days may be saved in a ship's port time, the results would more than pay all ordinary port charges of the ship, making the port, as compared with others not equipped, a free port to the ship.

The dividends paid indirectly to cities and states on account of their investments in port developments are varied, and, in the aggregate, enormous. Among them are the port's cash net earnings which should be sufficient to pay operating expenses, depreciation and fixed charges.

The harbor of New Orleans is commodious in extent, inexpensive in development, landlocked and well protected. On the New Orleans river front, we are studying and experimenting and gradually installing more mechanical devices so as to expedite the handling of freight at a lower cost. Our efforts in this direction, we are sure, shortly will be sufficiently developed to attract more freight and ships.

We are further devising ways and means for the gradual building of modern warehouses back of our docks, fitted with the best and most modern facilities, for coffee and other commodities. Their actual construction, however, is remote, as it will depend entirely on our earning capacity and the resultant ability to properly finance and find the funds needed.

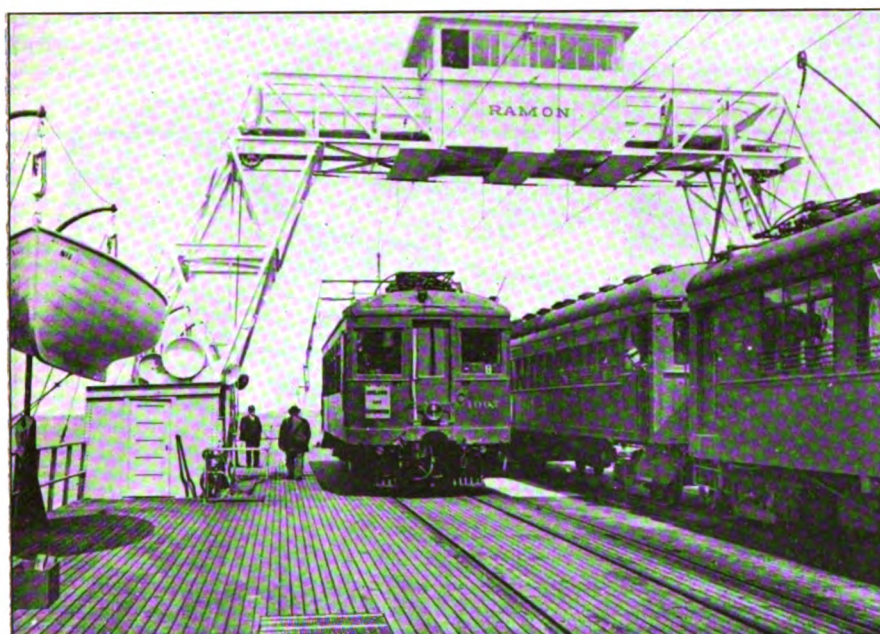


FIG. 3—VIEW OF DECK OF NEW FERRY BOAT

arately, and are of the open cross-head type, the lower part being cut away to form guides. These openings give access to the upper connecting rod brass, and also allow a positive oil feed to be fitted to the piston pin. This feed is secured through a forced feed oiling system.

The piston is exceptionally long, and has openings in the side to correspond with those in the cylinder. The piston pin is placed below these openings, and the circulation of air induced by the pumping action of the piston has a decided cooling effect on the upper connecting rod brasses, and on the upper end of the piston itself. One of the principal difficulties encountered with internal combustion engines of large cylinder dimensions has been the proper cooling of the piston. The designers, in this case, seem to have effectively solved the problem by the open cross-head design, by which the piston and pin

driven from the camshaft. Separate oil pipes lead from these lubricators to all the principal working parts. The pumps can deliver oil against a pressure of 80 pounds. The crank pin bearings are lubricated by means of a centrifugal oil ring fastened to the crank web and connecting with oil holes leading out to the center of the crank pin. The inlet and exhaust valve mechanism is so arranged that the side thrust of each cam is taken up by a valve lifter lever and roller of special design. The exhaust valves are water-cooled.

In addition to the main engine, an auxiliary engine of 20 horsepower is located on an intermediate deck at one end of the engine room. This engine is coupled to a generator for supplying current to the ship's lights and for lighting the cars in transit. It is also arranged to drive an air compressor and bilge pump.

The saving effected by the use of

Canal Will Affect Trade Routes

An Analysis of the Influence of New York Barge Canal on Traffic—Many Rates Affected

AN INTERESTING comparison of rail and barge canal freight rates in New York state, is drawn in a recent issue of the *Barge Canal Bulletin*. The annual saving through the use of the canal is estimated at from \$7,500,000 to \$15,000,000.

The differences in rail and water rates in New York state are shown in Fig. 2. In computing the water costs, ample allowance was made for loading and unloading. A rate was assumed which is from four to eight times as large as experts estimate the actual cost of water transportation will be under proper management. Cities in all sections of

cluding New York and some of the states of the middle west; also that a second increase is now being asked by the railroads which would mean another \$15,000,000 for the same territory. A large proportion of the state's population lives within a short distance from this waterway system, while a large percentage of its area is within easy reaching distance, either directly or by a combination of barge and motor truck. Of the state's population, 73½, 77, 82 and 87 per cent lives within 2, 5, 10 and 20 miles, respectively, of the internal waterways, while 46 per cent of the state's total area lies within 20

water route by the lakes and barges canal is considered.

The eastern end of the canal will be opened at the beginning of the 1916 season. This portion is several miles long, leaving the Hudson river at Waterford and passing through a land line to the Mohawk river above Cohoes Falls. It then traverses the canalized river, first in the pool formed by the Crescent dam, and then in the pool of the Vischer's ferry dam.

This section contains six locks compared with 21 in the old canal. These old locks include what are known to all canalers as the "sixteens," a series of

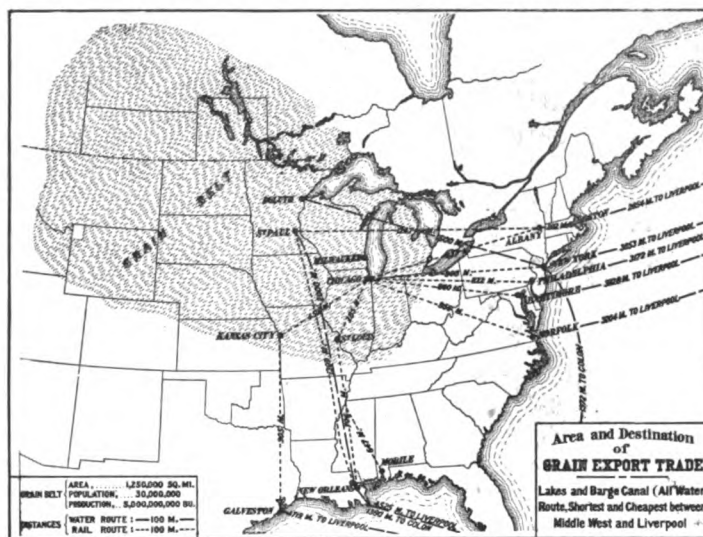


FIG. 1—EFFECT OF BARGE CANAL ON GRAIN EXPORT TRADE

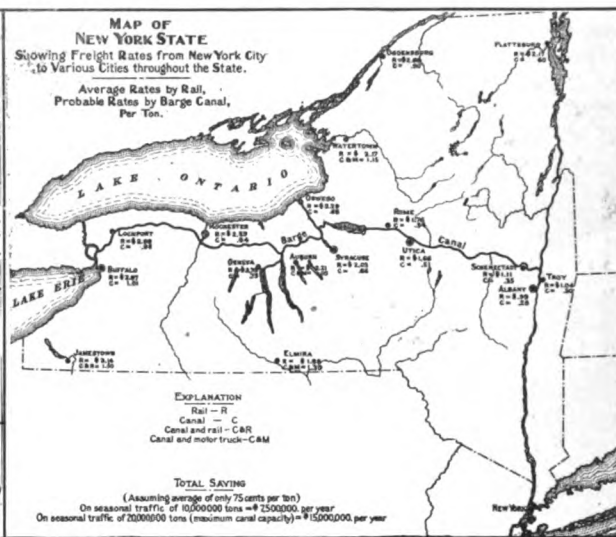


FIG. 2—COMPARATIVE RAIL AND WATER RATES FROM NEW YORK CITY

the state have been chosen, so as to make the chart fairly representative. For such localities as do not lie on the line of the canal, a combination of canal and rail or canal and motor truck is considered.

The barge canal law stipulates that a sufficient water-supply shall be furnished for a seasonal traffic of at least 10,000,000 tons. It is estimated that the supply is ample for a maximum traffic of from 18,000,000 to 20,000,000 tons. With a very conservative assumption of an average saving of 75 cents per ton, the chart shows that the total annual saving will be between \$7,500,000 and \$15,000,000. It is highly interesting in this connection to notice that a recent grant of increased freight rates to the railroads by the interstate commerce commission results in a total increase of \$15,000,000 annually for the freight carried in the territory affected by the barge canal, in-

miles of the waterways and 71 and 88 per cent of the area are within 50 and 70 miles, respectively. These latter are the respective distances which motor trucks of 3½ and 2 tons capacity can cover in a day's run, going and returning. With improved highways, the capacities of these trucks can be increased to 5 and 3 tons, respectively.

The effect of the canal on grain export trade is shown in Fig. 1. The Great Lakes and the barge canal are shown to form an all-water route which is the shortest and cheapest between the great grain belt of the United States and Canada and the European markets. From the illustration, it will be noted that a shipment starting from the head of Lake Superior and going by way of the Mississippi river, for 2,000 miles, is still 4,500 miles from Liverpool, no nearer its destination than at the beginning, when the possible 4,500-mile

locks lying in close proximity, within a stretch of about three miles, in or near Cohoes. The size and manner of operation of the locks, however, are radically different. The old lock and its lock-tender, with back against balance beam laboriously pushing his way along a cleated path, may be more picturesque, but they are indicative of the age of small things and a period when time was not an important factor and not of the modern days of big business, speed and efficiency.

The new locks will be operated by electric power, energy being generated from the head obtained between the levels. It will be possible to operate the locks by manual power, but the gates and valves are so large and heavy that such means will consume too much time and will be resorted to only in case of emergency. The Waterford locks secure power from Crescent dam.

On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

New Orleans and the Gulf

By Harry H. Dunn

JOSE TAYA SONS, Inc., a Spanish firm, with New World headquarters in New Orleans, has purchased three steamers in New York to handle a part of its lumber trade. The plans of this firm to buy these vessels were described previously in *The Marine Review*, and John G. Oriol, American president of the company, announced the purchase on his return recently from an extended trip to Spain and New York. The Taya line operates directly between New Orleans and Barcelona, and will load with lumber and cotton. The three ships purchased are LUISA, 6,000 tons; ASUARCA, 5,000 tons and JOSEFA RAICH, 4,700 tons. ASUARCA, which was discharging cargo at Savannah when purchased in October, came immediately to New Orleans, and sailed Nov. 8 from New Orleans for Spanish ports. The second sailing will be JOSEFA RAICH, in December. The date of sailing of LUISA has not been set. According to Manager Henry Plassan, the company plans to purchase three more freighters soon, and will maintain monthly sailings out of New Orleans.

Lumber companies of Memphis, Tenn., and Gulfport, Miss., have formed a \$100,000 company to establish a steamer line between Gulfport and Europe. Promoters of the company are Henry Piaggio, Gulfport and Genoa, Italy, and Hunter Benn of Mobile and Gulfport. Other backers of the company are hardwood lumber exporters who have been using Gulfport for shipment of their products to Europe. General cargoes will be handled, when possible, as well as lumber, but special attention will be paid to the latter. Among the stockholders are Henry Piaggio, Hunter Benn & Co.; Woodford T. Stewart, Russe Burgess; Gayoso Lumber Co.; May Bros.; E. Sodenheimer & Co.; Dudley Lumber Co.; Anderson Tulley & Co.; R. J. Dornell, Inc.; S. J. Duhn; Penrod, Jordan & McGowin; and A. L. Staples.

The one-time private yacht, STRANGER, which was converted into a river gunboat during the war with Spain, and later turned over to the Louisiana naval militia, is to be sold. She was sunk while moored at the New Orleans naval station during the storm of September 29.

Steamer lines, both passenger and freight, operating between New Orleans and Mexican ports, refuse to fix definite dates of sailing to or from either New Orleans, Vera Cruz or Tampico, owing

to the inhospitable attitude toward American shipping assumed by the Carranza authorities at the two Mexican ports.

Direct steamship service to handle the annual crop of Mexican hemp, better known as henequen, is to be established shortly between New Orleans and Merida, Yucatan, as a result of the securing of \$10,000,000 credit from two banks of New Orleans by the Henequen Growers' Association of the Mexican state. Through this loan, the entire crop of henequen, valued at between \$100,000,000 and \$125,000,000, annually, from the states of Yucatan and Campeche, will be marketed through New Orleans, instead of through New York and Boston, as heretofore. Merida, the capital of Yucatan, hitherto has been the distributing center, the fibre being sold from there by agents in the United States, but beginning with this year's crop, the henequen will be brought to New Orleans and distributed from here. The \$10,000,000 to be advanced will be secured by warehouse receipts on henequen stored here, and it is planned to keep at least \$15,000,000 worth of the hemp on hand at all times in New Orleans. A factory for the making of cordage and bags from the

fibre is also planned. The loan agreement was signed by Sol Wexler, president of the Whitney Central National Bank, and Lynn H. Dinkins, president of the Interstate Banking & Trust Co., of New Orleans, and by Victor A. Rendon and Julio Rendon, Merida, Yucatan, representing the henequen association. The latter two have returned to Merida to make preparations for the establishment of the steamer line and the erection of the cordage mill.

Steamer men on the river are fighting the proposed reduction to a barge line basis of freight rates on sugar and molasses, which has been asked of the Louisiana state railroad commission by Capt. J. E. Comeaux. Capt. H. M. Carter, of the Carter Packet Co., and Capt. Charles W. Brown, traffic manager of the Steamboat Traffic Association, went to Baton Rouge late in October to protest the reduction. Present river rates are 65 cents per barrel on molasses and 10 cents a hundredweight, about 35 cents per barrel, on sugar, the routes covered being between Bayou Sara and intermediate points and New Orleans. The new rates sought by the barge men are 40 cents per barrel on molasses and 25 cents per barrel on sugar.

Up and Down the Lakes

By A. A. Eiben

THE largest amount of grain to pass through the Soo canal in one operation was recently locked down when the steamers W. GRANT MORDEN and W. M. P. SNYDER JR. passed through the Davis lock. Both vessels were loaded with wheat, SNYDER JR. carrying 460,000 bushels and MORDEN 450,000 bushels. SNYDER JR.'s cargo established a new record load, exceeding the previous record held by MORDEN of 456,000 bushels.

It is believed that Dock No. 4 at Conneaut has established a new record for unloading vessels in a season when it unloaded its eight hundredth boat recently. In addition to this, the dock has assisted other docks in finishing numerous cargoes.

A recent announcement is to the effect that the Duluth & Iron Range railroad will build a new concrete dock at Two Harbors, Minn. The new pier will be located south of dock No. 1 and will be 80 feet high,

equipped with 288 pockets arranged to handle four steamers simultaneously. Bids will be asked for at once and it is expected that work can be carried on this winter. Dock No. 6 will be remodeled and the combined cost of repairs and the erection of the new dock is estimated at \$1,635,000. W. A. Clark is chief engineer of the Duluth & Iron Range railroad.

According to a recent ruling by the board of supervising inspectors, tarpaulins must be kept on hatches until vessels reach port, and notices will be sent out stating the ruling must be observed.

The steamer MORRIS ADLER, building for Atlantic coast owners at the Ash-tabula yard of the Great Lakes Engineering Works, will leave for the coast during the latter part of November.

A score of the largest lake freighters will be moored at Toledo during the

coming winter, including many of the vessels of the Pittsburgh Steamship Co.'s fleet.

An award was recently made by C. E. Kramer, Chicago, arbitrator in the collision case between the steamers D. Z. NORTON and W. C. AGNEW, which occurred Oct. 11, 1914, in Lake St. Clair, holding AGNEW wholly at fault and exonerating NORTON. The damage to both vessels, amounting to \$11,000, will be paid by AGNEW. Both vessels were down-bound with ore and AGNEW was trying to pass NORTON when the collision occurred. AGNEW is owned by the Buffalo Steamship Co., John Mitchell, manager, Cleveland, and NORTON is owned by the Norton Transit Co., W. C. Richardson & Co., managers, Cleveland, O.

The Crosby Transportation Co., Milwaukee, Wis., has announced that it will probably raise the passenger rates of the line on April 1, 1916, owing to the stringent provisions of the seamen's law. It is said that the law will not seriously embarrass the boat lines operating out of Milwaukee, but that its enforcement will probably result in a general advance in passenger rates on the Great Lakes.

Captain Philo B. Ludington, retired vessel master, died at Detroit recently at the age of 84 years. In his early life Captain Ludington engaged in wrecking operations and diving on the lakes, later becoming associated with the Gilchrist interests at Alpena.

Record dispatch has marked the construction of the cement work of the dry dock building for the American Ship Building Co., at South Chicago, Ill., the cement walls for the entire dock having been completed in less than four weeks. The contractors worked night and day on this construction work and the dock will be ready for use in November.

In New York Harbor

By George Nicholson

THE American steamship OCEANA, 4,320 net tons, was sold recently by the Morse Dry Dock Co. to the Compania Transatlantica. She has been placed under the Spanish flag and her name changed to ALFONSO XIII. She will carry passengers between Cadiz and Havana. She was built in 1891 by W. Denny & Bro. at Dumbarton, Eng., and is a twin screw steel steamer with a promenade deck. She is 531 feet over all, 54 feet 8 inches beam, and 17 feet 9 inches draft. Her equipment consists of two triple expansion engines, 32½ x 57½ x 92 inches, and 60 inches stroke, developing 1,440 horsepower.

Newark, N. J., will make a strong bid for some of the steamship trade, of which New York has practically a monopoly. A year ago, Newark awarded a \$500,000 contract to the Atlantic, Gulf & Pacific Co. to build a ship canal three miles long through the Newark Meadows into the heart of the city. The canal will be 25 feet deep. As the government is deepening Newark bay, all but the largest

ocean-going ships will be able to use the canal. It is now about half completed.

The new motor light vessel No. 54 was given her trial trip in New York harbor recently. The vessel is powered with a 100-brake horsepower, three-cylinder, direct reversible heavy duty oil engine for propulsion. Two Mietz & Weiss vertical oil engine compressor units furnish the air for pumps, anchor hoists and siren. After the trials, which were satisfactory in every way, the vessel proceeded from Staten Island to her station off Boston under her own power.

The new British motorship MISSISSIPPI recently arrived at New York from London, having made the voyage in 13 days. While coming across the Atlantic she was twice chased by sub-

marines, but escaped, owing to her speed of 11½ knots. She is 370 feet long and powered with Burmeister & Wain diesel engines of a total of 3,600 initial horsepower.

The sidewheel passenger steamers MAJESTIC and NEWARK, of the Merchants' Steamboat Co., Newark, N. J., are reported to have been sold to interests on the Potomac river.

An interesting installation of a new type of boiler is being made in the Pennsylvania railroad tugboat SYOSSET. A 1,000-horsepower Talbot oil-burning flash boiler is being installed. The installation is being closely watched by local steamboat interests.

The government is dredging the Passaic river to Newark to a depth of 40 feet.

Along Puget Sound Shores

By F. K. Haskell

AFTER an adventurous career as a smuggler, sealer and fishing vessel, the once palatial yacht HALCYON, former pleasure craft of John D. Spreckels, the San Francisco millionaire sugar operator, will probably end her days as a trader on the Mexican coast. She has been purchased by Thomas Tjerandsen and Edward Peterson of Seattle, from the Victoria Sealing Co. and will be sold at Mazatlan.

Representing an investment of approximately \$325,000, the Alaska Steamship Co. has purchased the freight and passenger liner KANSAS CITY, formerly of the Pacific Mail fleet, and announces that the vessel will be placed in the southeastern Alaska trade plying out of Seattle. KANSAS CITY was formerly operated between San Francisco and Portland by the Portland & San Francisco Steamship Co. and by the Pacific Mail Steamship Co. between San Francisco and Panama.

The daring work of Capt. Reed of the tug WALLULA saved the Peruvian schooner JUDITH from going on the beach just south of the mouth of the Columbia river recently. With all sails set, the sailing vessel was headed direct for the coast. The weather was hazy and the master of the windjammer had evidently lost his bearings. Capt. Reed rushed to her rescue and ran WALLULA into the breakers. He succeeded in getting a line aboard JUDITH and turned her around. The hawser parted but the barkentine, however, put on more sail and succeeded in getting back to sea.

Fire, supposed to be of incendiary origin, destroyed Pier 14 at the foot of Broad street, Seattle, on Oct. 29. The pier was occupied by Dodwell & Co., Ltd., agents for the Blue Funnel Line of British steamers. The loss will probably exceed \$500,000. The Blue Funnel steamers have been carrying barbed wire, machinery and implements of war for the Russian army.

Swayne & Hoyt, who have been operating the Arrow line of steamers

between Portland and San Francisco, carrying general merchandise, wheat and lumber, have announced that they will maintain a regular five-day schedule between the two ports with three steamers, DAISY PUTNAM, DAISY GADSBY and WILLIAM H. MURPHY.

The Chicago, Milwaukee & Puget Sound railroad has installed on its tide-flat frontage in Tacoma a modern terminal, including a grain elevator. This company has cut a private waterway for the use of its oriental steamers. This waterway is 2,000 feet long, 215 feet wide, and has a depth of 35 feet at low water.

It is the purpose of the port authorities of Astoria, Ore., to operate boats from that city to Lewiston, Ida., and work will shortly be started on the construction of vessels able to navigate both the Columbia and Snake rivers. Service will be inaugurated early next year. The work is in the hands of Captain Arthur Riggs.

After lying at Honolulu for more than a year, the cargo of lumber laden at Tacoma on the Kosmos liner SETOS for Melbourne, is finally to be sold. SETOS loaded at Tacoma just prior to the outbreak of the European war, and at sea was warned by wireless and instructed to put in at Honolulu for orders. The cargo is valued at \$75,000.

The Japanese steamer KUROHIME MARU has been chartered by Frank Waterhouse & Co., Inc., Seattle, for one voyage in the Seattle-Vladivostok trade. She is the eleventh vessel in the fleet chartered by the Waterhouse company for its Vladivostok service. KUROHIME is a modern freighter, built in Port Glasgow, Scotland, in 1905, with a cargo capacity of 6,200 tons. She is 340 feet long, 48 feet beam and 18 feet draft.

The great increase in the coastwise business of the Standard Oil Co. has resulted in the bringing to the Pacific coast of the new tanker DE SOTO, recently built in the east. She has a carrying capacity of 70,000 barrels.

Around the Golden Gate

By A. A. Willoughby

THE UNION IRON WORKS has nine ships building or under contract and the yards are the busiest they have been in some years. Two freighters are in the water and will be completed during the present month. The building program also includes two tankers for the Union Oil Co., three tankers for the Standard Oil Co., a freighter for Hind, Rolph & Co., and a new Matson boat, practically a duplicate of MATSONIA. The two freighters are being equipped with Curtis geared turbines and are built on the Isherwood system. Each has a carrying capacity of 9,000 tons. One of the Union tankers will have geared turbines installed and both will be constructed on the Isherwood system. None of the Standard tankers has been started. The new Matson boat will cost in the neighborhood of \$1,000,000 to build. A large bucket dredge for use in gold dredging is also under way. Three shifts are being operated in some of the divisions and about 3,000 men are now on the company pay roll. A steel slip-way with a locomotive type of overhead electric crane is being constructed. Two other slips are being extended 50 feet. A number of new machine tools have been purchased and a new tool room with practically all new equipment has been added. Additions to both the sawmill and the joiner shop are under way.

* * *

The Shell Oil Co., which is erecting a big refinery at Martinez, has contracted for the construction of three oil barges for use on the San Joaquin and Sacramento rivers and on the bay. Each barge will have a carrying capacity in excess of 20,000 barrels.

* * *

One of the old wind jammers, E. P. RITHEP, of the Matson fleet, which has been on the Honolulu run for the past 25 years, is on her last trip as a sailing vessel. She will be converted into an auxiliary schooner. She was one of the first boats of the Matson line. Capt. Chas. Jackson will continue in charge.

* * *

Five of the largest coastwise steamship companies, the Pacific Coast Steamship Co., Great Northern Pacific Steamship Co., San Francisco & Portland Steamship Co., Independent Steamship Co., and Pacific Navigation Co., have instituted proceedings before the state railroad commission to have approximately 50 firms, principally lumber companies, which are operating steamships carrying passengers and freight, declared common carriers and compelled to file rates and schedules.

* * *

The Japanese are quick to seize the opportunity afforded them of picking up the trade for the Orient from San Francisco, and that port has been included in the schedule of the South American fleet operated by the Toyo Kisen Kaisha. ANYO

MARU stopped there recently on her way to South American ports and will call regularly, as will SEIO MARU and KIYO MARU of the same line. One of these liners will call each month.

* * *

San Francisco may become the terminus for another steamship company operating along the west coast of Mexico. Levick & Oliver, of that city, have had the steamer SOUTH COAST testing the prospective field and may install regular service.

* * *

The news that Secretary of the Navy Daniels had approved the plans of the Union Iron Works for a mammoth dry dock at Hunters Point, was received enthusiastically in local shipping circles. Work will be commenced by the first of the year and the structure will be completed in three years. The dock is to be 1,000 feet long, 40 feet deep and 110 feet wide and can handle the largest battleship afloat. The estimated cost is \$2,000,000. The navy department agrees to furnish \$50,000 worth of work annually.

* * *

Due to the European war, San Francisco has become the clearing-house for the south seas copra trade, and many wind jammers have been making port loaded to capacity. This product of the coconut groves formerly went to France where there was a large demand for its use in making perfumery and soap.

On the Delaware

By Dr. C. S. Street

THE two new piers were taken over by the Philadelphia officials late in October. These piers are located on the Delaware river at Queen and Christian streets and give this port proper facilities for loading and discharging the largest steamers. The two piers are less than a mile from the center of the city, and have direct railroad connections to the trunk lines. They are 180 feet wide and 550 long with 200-foot docks flanking each pier. Mechanical freight handling apparatus has been installed.

* * *

The steel collier, VIRGINIA, built for the Pocahontas Navigation Co., was launched recently. She will run in the coal trade between Baltimore and Boston. The collier was built by the New York Shipbuilding Co. and is a sister ship to NORFOLK, built by the same firm for the Coastwise Transportation Co. VIRGINIA is a single screw vessel, 319 feet in length, 49 feet 3 inches beam, with a tonnage of 3,625. She is expected to make 10½ knots. Particular attention was given to the double bottom, so that the new collier may carry water ballast.

* * *

The Atlantic City Steamship Co. has established a route from pier 16, Dock

street, Philadelphia to Atlantic City, N. J. This steamer line will carry freight and passengers. The one drawback to the line is crossing the inlet at Absecon. Several vessels have been lost there while trying out the passenger line, from Philadelphia. The new company has had help from the state and government and the inlet has been dredged. New buoys and lights have been set.

* * *

The keel of the new steamship GEORGEANNA WEEMS has been laid in the yards of the Harlan & Hollingsworth Shipbuilding Co., Wilmington, Del. She is to be used by the Baltimore & Carolina Steamship Co. and will be similar to HENRY WILLIAMS of the Baltimore company, but will be 17 feet longer.

On Boston Bay

By George S. Hudson

BIG coasting schooners are in demand for foreign voyages and the supply of these vessels is inadequate. Only a few days ago, the five-master CORA F. CRESSY was fixed to load a cargo of 85,000 cases of oil for Rio de Janeiro at the high rate of 35 cents per case. This schooner had been making a precarious living in the coal trade between Chesapeake bay and New England ports. Another schooner, the six-master EDWARD J. LAWRENCE, a collier, is carrying a cargo of 5,000 tons of coal to Barcelona, Spain, the rate being \$10 per ton or \$50,000 for the voyage with good prospects for a return cargo. HOWARD PALMER, another five-masted collier, has been chartered to carry 4,000 tons of coal to Lisbon, Portugal, at the same rate as LAWRENCE. There is some speculation as to what sort of weather these big fore-'n-afters will make on the Atlantic at this season when loaded almost to capacity with a rather unwieldy cargo. But the five-master Gov. AMES, first of the type, when new, carried a coal cargo to Australia, went to Liverpool and returned to Boston with no particular trouble.

* * *

Col. John Millis, in charge of the U. S. engineers, at Newport, R. I., will recommend that an anchorage area in Nantucket and Vineyard Sound be tried for the period of one year and that a powerful cutter or tug be assigned to assist vessels that may get caught in calms and are unable to move out of the prescribed fairway. No penalty, however, is to be attached to the proposed regulation, which, in the opinion of shipping men who attended a hearing on the matter in Boston recently, will lessen danger of collision in thick weather. Col. Millis, at the request of the New England Steam Navigation Co., which operates boats between New Bedford, Mass., and Nantucket, recommends that the lanes used by these steamers be kept clear of anchored shipping.

* * *

The new seamen's law affects about 600 men at Boston, and Capt. O. G. Hains of the U. S. local steamboat inspection service, is busy with examinations. Many men who wanted the A. B. rating were turned down on account of physical unfitness.

Red Hot Tips From the Trade

Pertinent Suggestions and Personal Gossip

THE Carnegie Steel Co., Pittsburgh, has issued a pamphlet describing its line of bulb sections. The booklet contains tables and data on all of the profiles now being rolled by the Carnegie company. It was issued in recognition of the increasing use of these sections.

Some years ago, bulb angles and bulb beams were used extensively in ship building. At that time steel manufacturers in this country rolled a limited line of both sections. Later steel channels were utilized in place of bulb sections in ship construction and for many years the tonnage of the latter sections rolled was extremely limited. Recently, however, the bulb angle and bulb beam type of construction has again gained in favor. In addition, the bulb angle section has now come into use for strengthening the tops of all-steel gondola freight cars. A number of sizes particularly designed for this purpose have come into use.

The revival of ship building in the ship yards of the United States and other neutral countries, brought about as a result of the European war, has led to the construction of a number of vessels according to recognized English standards. In these, the bulb angle is utilized in the framing of the floors.

The Carnegie Steel Co. announces that it now rolls for the first time in the United States, a fairly complete line of bulb angles to standards adopted by the British Standards Committee.

Sounding Machine

Steam engines for operating the Cosmos sounding machine have been installed by C. G. Quillian on the steamer McARTHUR and launch DELTA, of the United States coast and geodetic survey, and are said to be a decided success. The device consists of the ordinary type of Cosmos machine, equipped with a three-cylinder, self-contained, Ingersoll-Rand steam engine of the brotherhood type, mounted on the same base. Rope-drive pulleys are attached to the shaft of the wire drum and to the engine shaft. A friction brake acts against the inner rim of the wire drum and a heavy idler wheel on a swinging arm gives necessary tension in the rope drive.

On the ship the machine is mounted abreast the bridge on the port side,

and the sounding wire leads from the drum through a sheave on the weighted end of a long arm, then through a registering sheave on the bridge, thence to a fair-lead on pipe davit and to water. The tension of the lead on the arm holds the arm out of vertical. The arm swings to a vertical position when the lead strikes bottom and takes up slack in the wire until the brake is applied. The machine and registering sheave are advantageously located, as the position adopted on McARTHUR enables the officer on the bridge to verify the depth on register and check the verticality of the wire. Using a 12-pound lead, soundings of 150 fathoms were obtained in two minutes, and the engine reels in 120 fathoms per minute. The ship goes ahead with 100 fathoms of wire out, except when turning with a port helm. On DELTA the machine is mounted on the stern and the wire leads over a registering sheave to the water. The machine has been used in depths up to 130 fathoms, and the lead was up long before the stop for the next sounding.

The machines are said to reduce the number of men required and make the force available for another field party. The machine has also increased the speed of sounding with DELTA.

The International Oxygen Co., New York, is erecting an oxygen and hydrogen generating plant at Verona, a suburb of Pittsburgh, Pa. This new plant will enable the company to make better deliveries in the Pittsburgh district than were possible from the plant at Newark, N. J. The new plant will be in charge of Philip J. Kroll.

Thermit Catalog

An 80-page catalog, issued by the Goldschmidt Thermit Co., New York, discusses the use of thermit in mill and foundry practice. The catalog contains detailed information and directions for welding wrought iron and steel sections and numerous illustrations are included, showing various classes of work repaired by the thermit process. Also, the various jobs are described in detail, which makes the catalog exceedingly valuable to

those engaged in this work or contemplating thermit welding operations. The use of thermit for increasing the temperature of iron and steel, particularly in the ladle, also is discussed and the making of semi-steel in the ladle is described. A chapter on the use of thermit in foundry practice is exceedingly interesting and should prove of value to everyone engaged in the manufacture of iron and steel castings.

Marine Department

The Westinghouse Machine Co. announces the formation of a marine department with headquarters at East Pittsburgh to handle all matters pertaining to the sale of marine refrigerating and main propulsive machinery for vessels. All Atlantic seaboard and Great Lakes negotiations for the sale of Westinghouse Machine products will be handled by H. M. Southgate, district manager, Bibbs building, Washington, D. C. The Pacific coast marine business of this company will be handled by Hunt, Mirk & Co., 141 Second street, San Francisco, Cal.

The George Stratford Oakum Co., Jersey City, N. J., has announced that any employee who is now, or later may become, a member of the New Jersey National Guard, will be allowed vacation with full pay during such working days as he may be called upon for parade, encampment or other military activities.

John A. Stevens, engineer, announces the removal of his office from 107 Merrimack street to the Sun building, 8 Merrimack street, Lowell, Mass.

Ralph T. Coe, who has been manager of the Canadian Sirocco Co., Ltd., Windsor, Ont., has resigned to enter the engineering service and sales field in New York state. He has been appointed district manager for Warren, Webster & Co. and the American Blower Co., with offices at 519 Insurance building, Rochester, and 19 Live Stock Exchange building, Buffalo.

THE MARINE REVIEW

VOL. 45

CLEVELAND

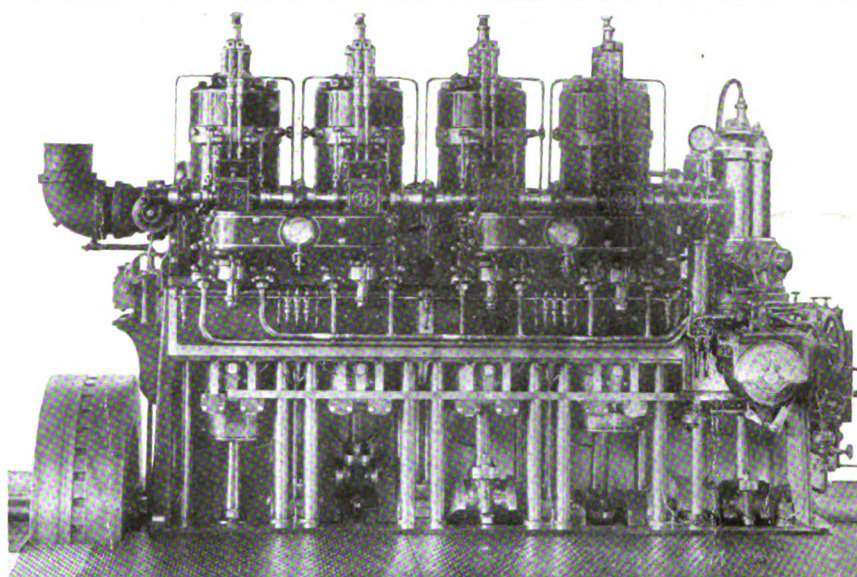
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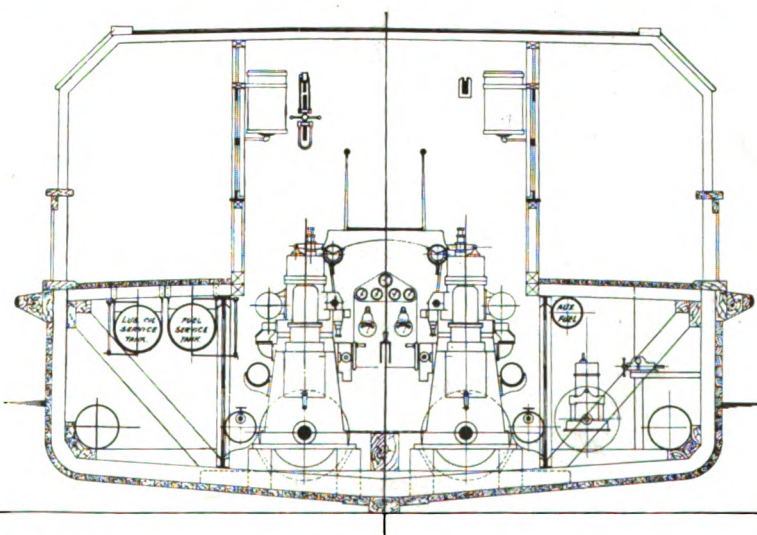
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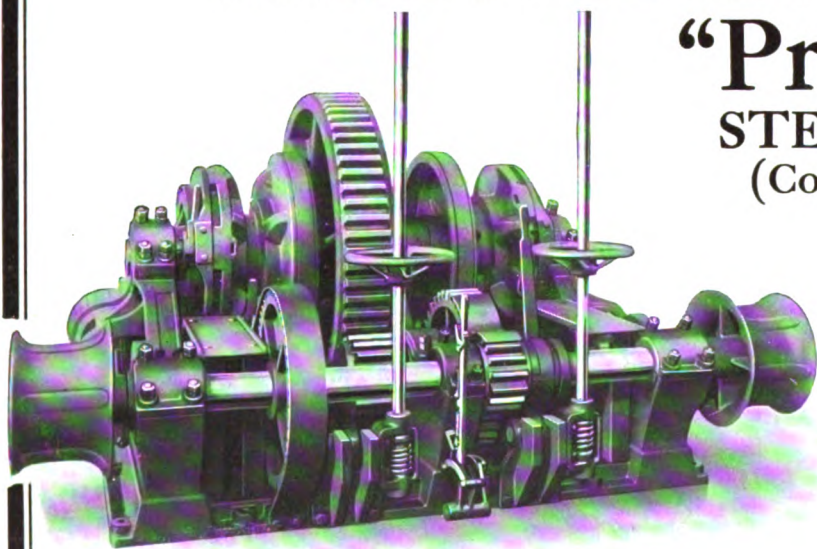
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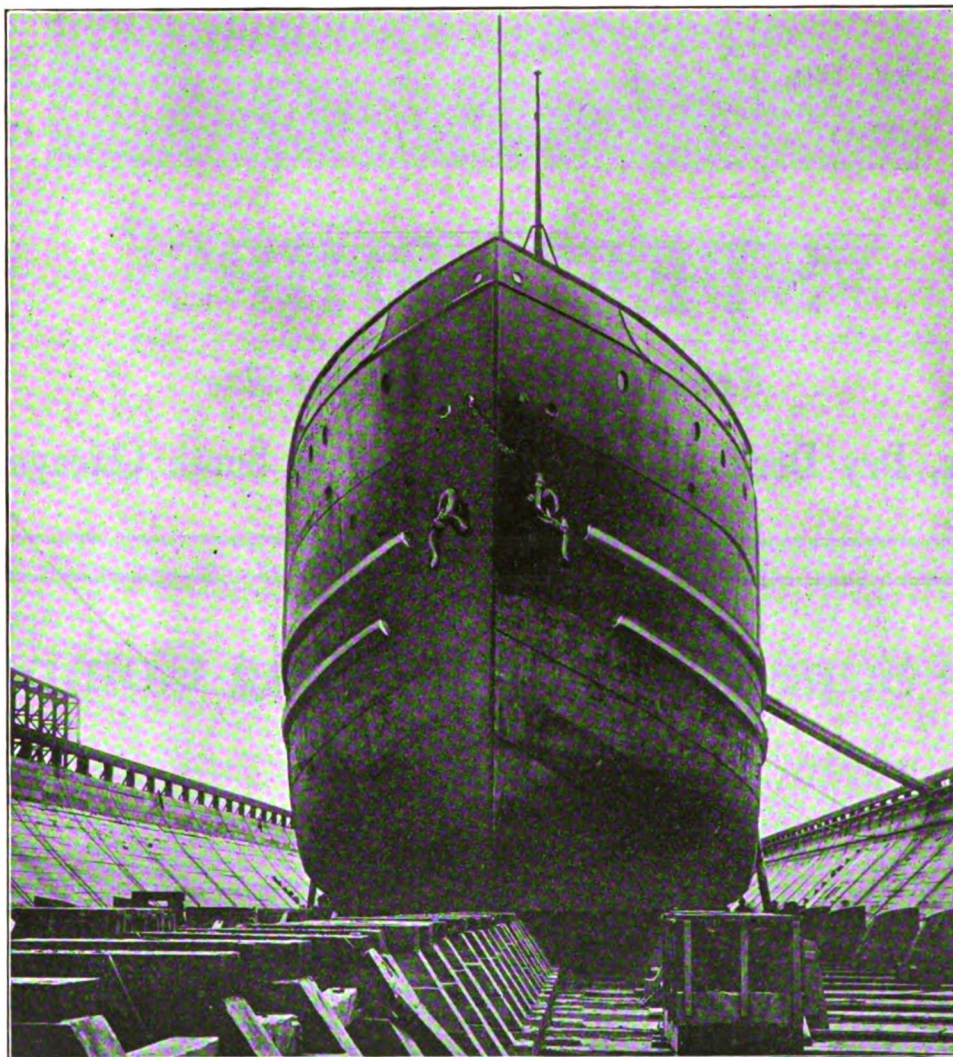
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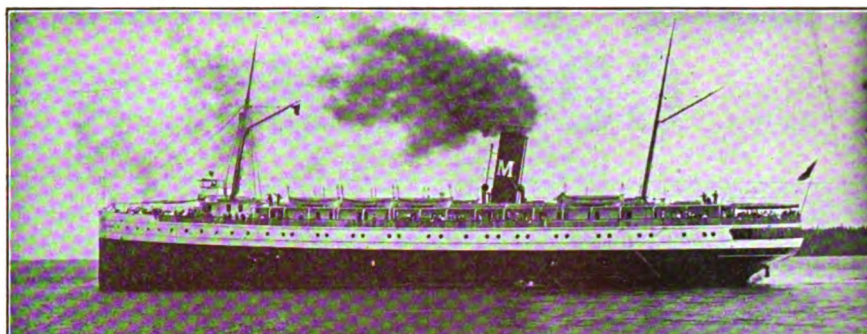
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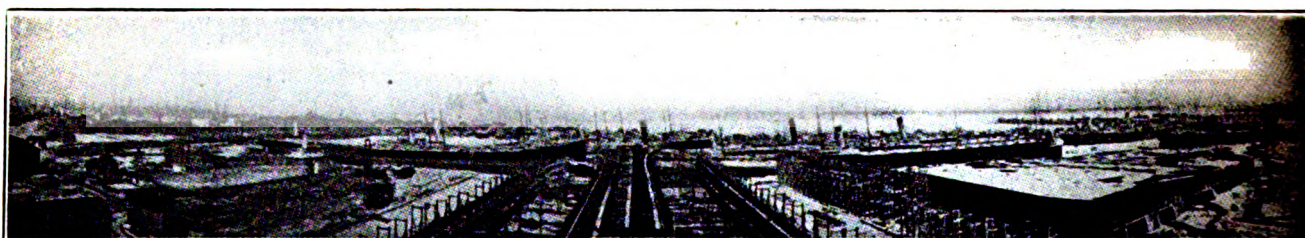
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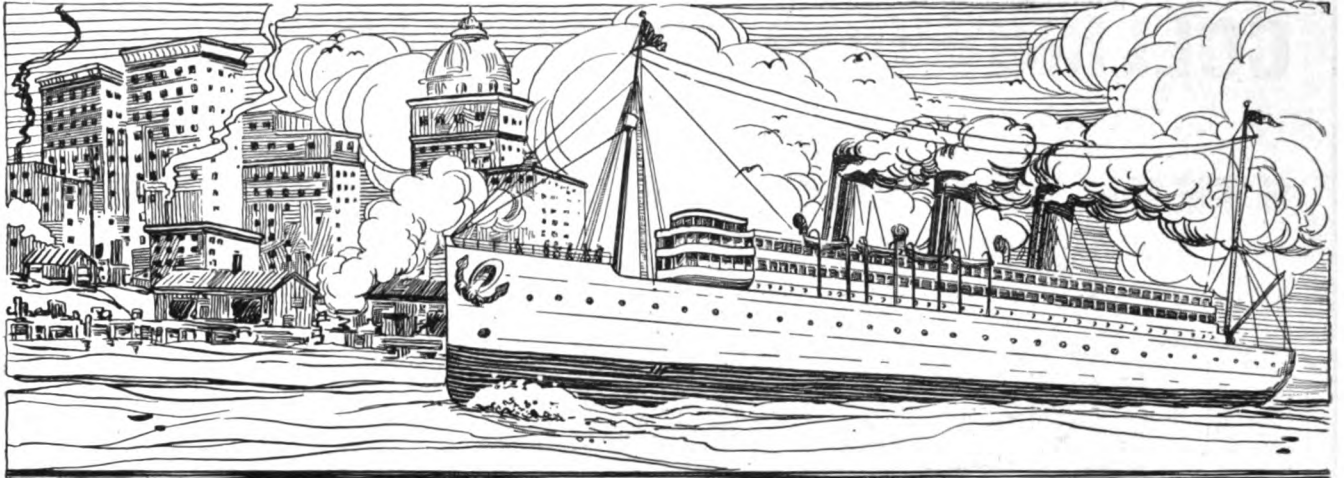
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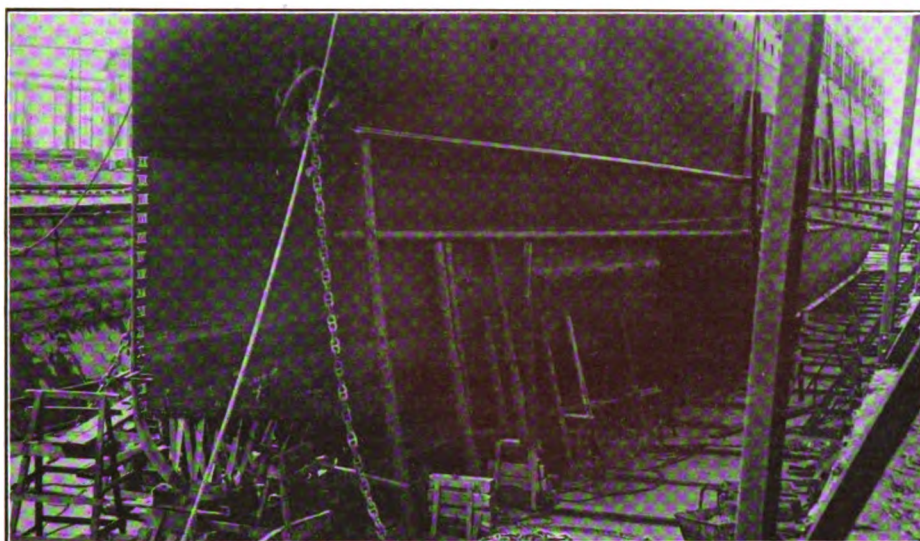
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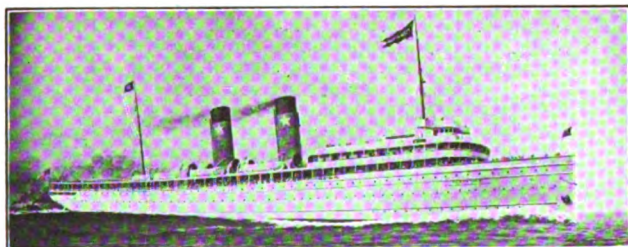
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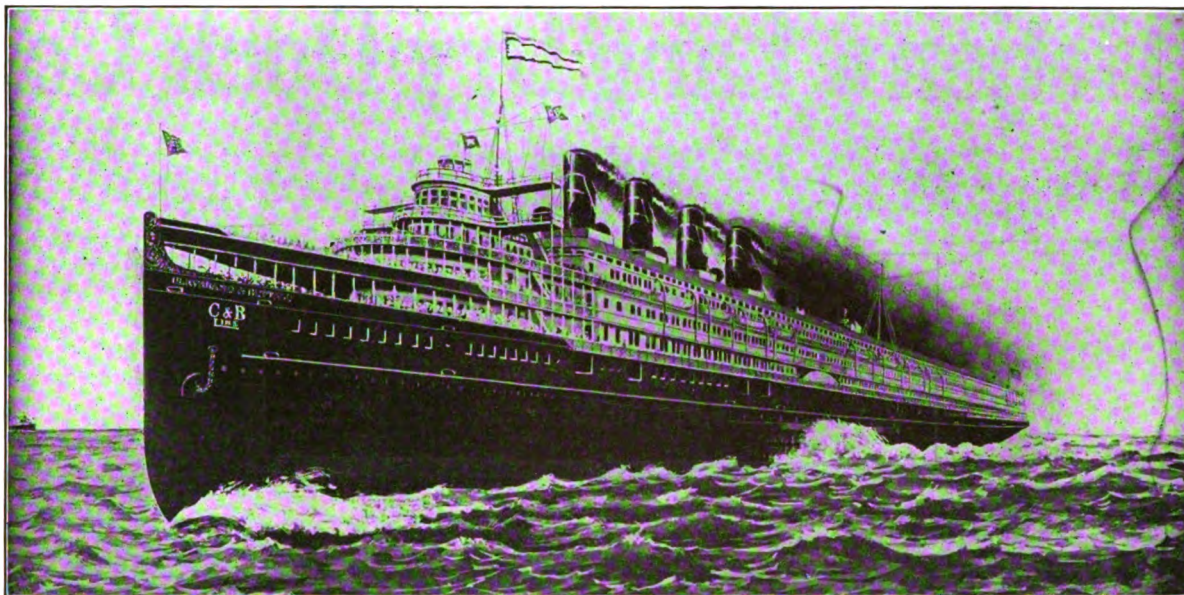
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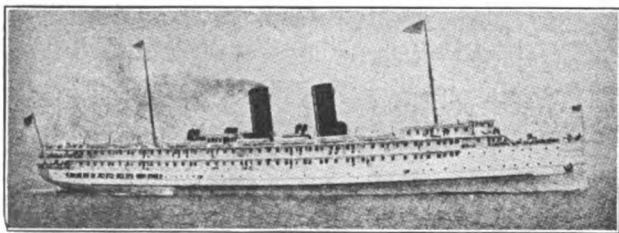
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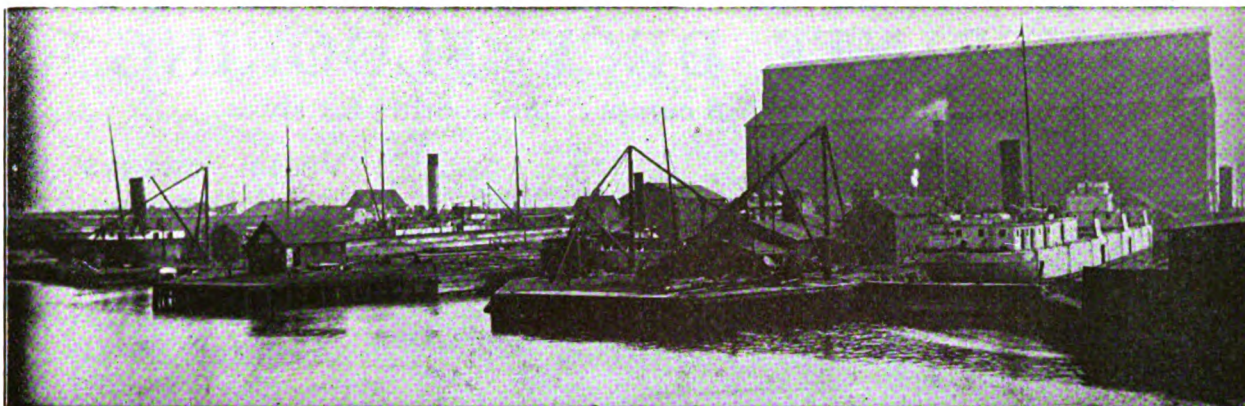
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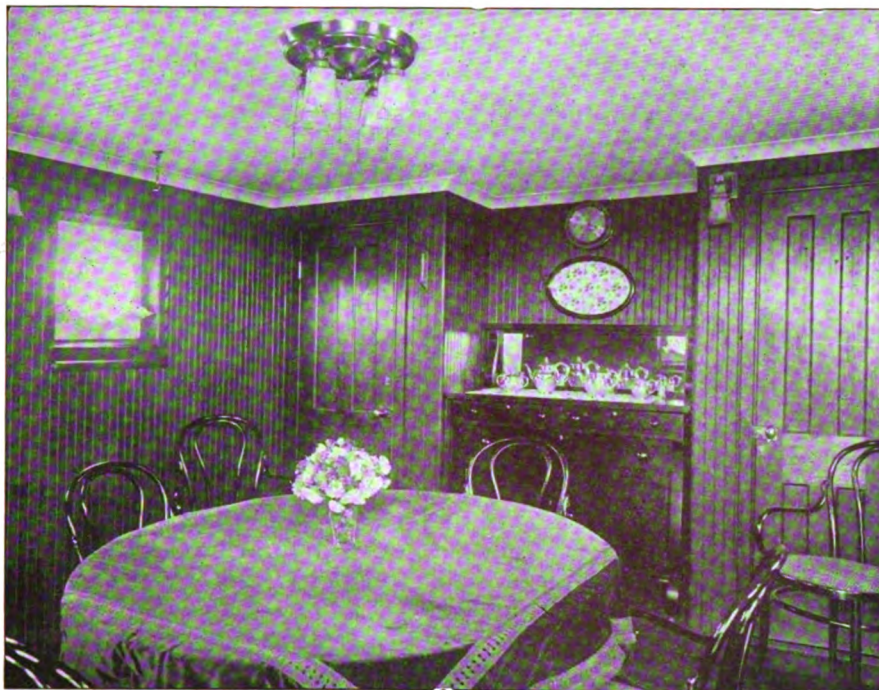
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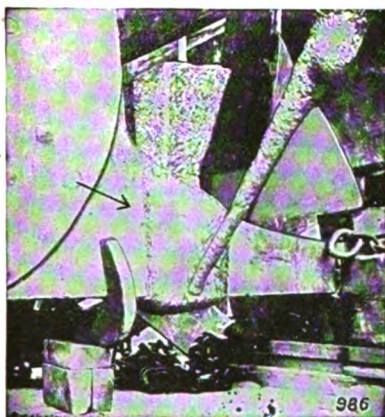
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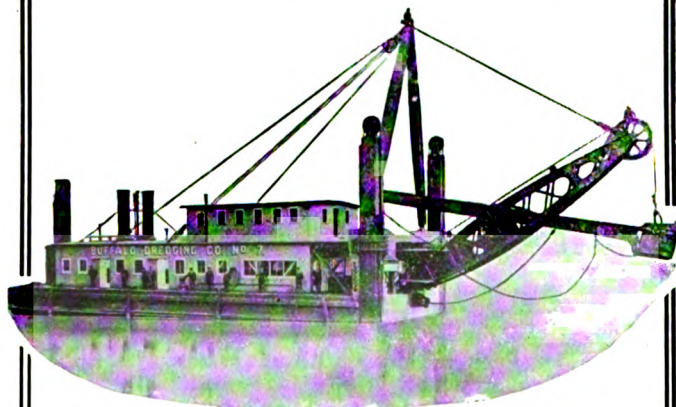


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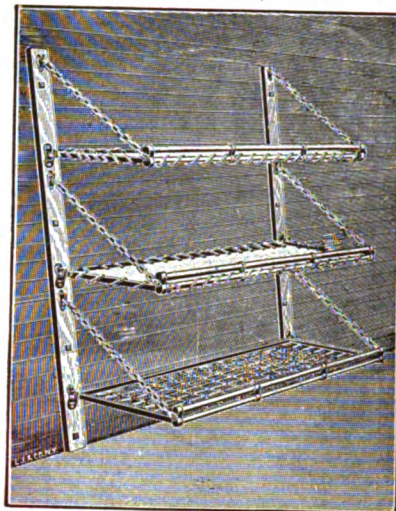
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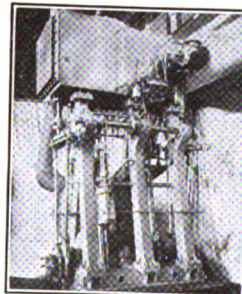
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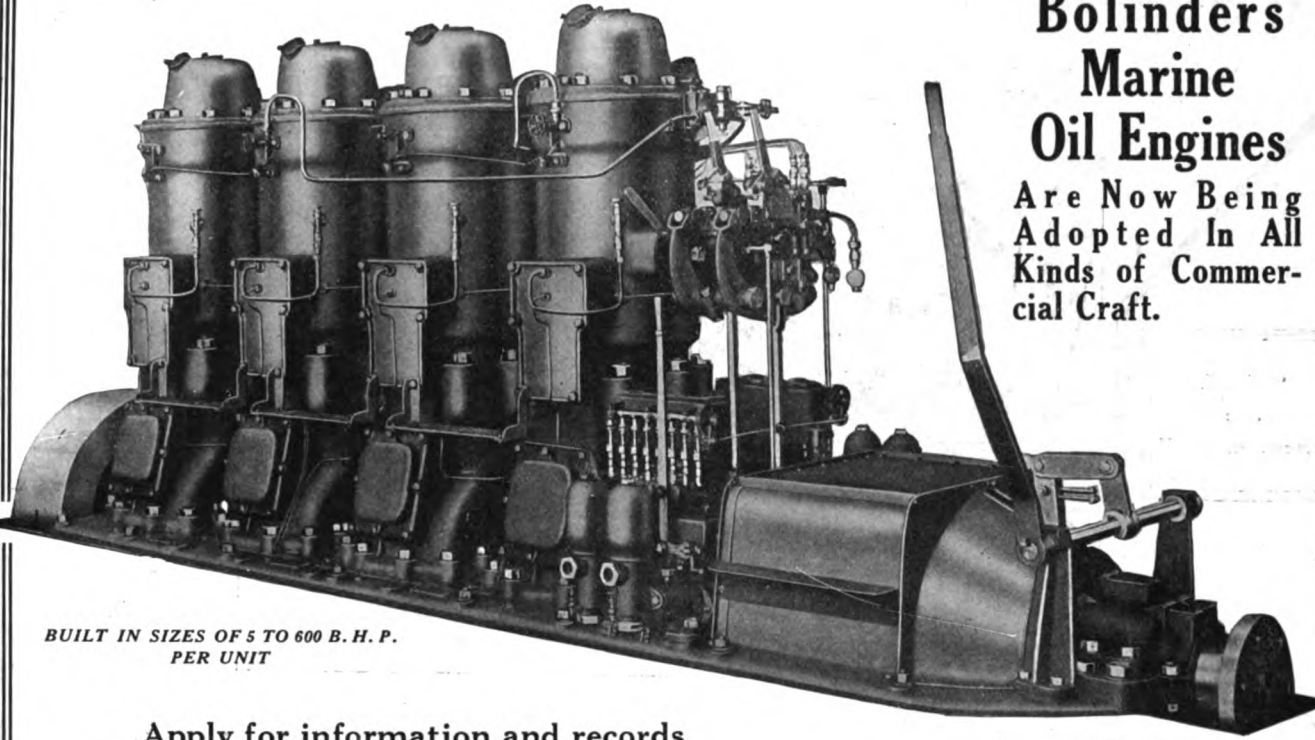
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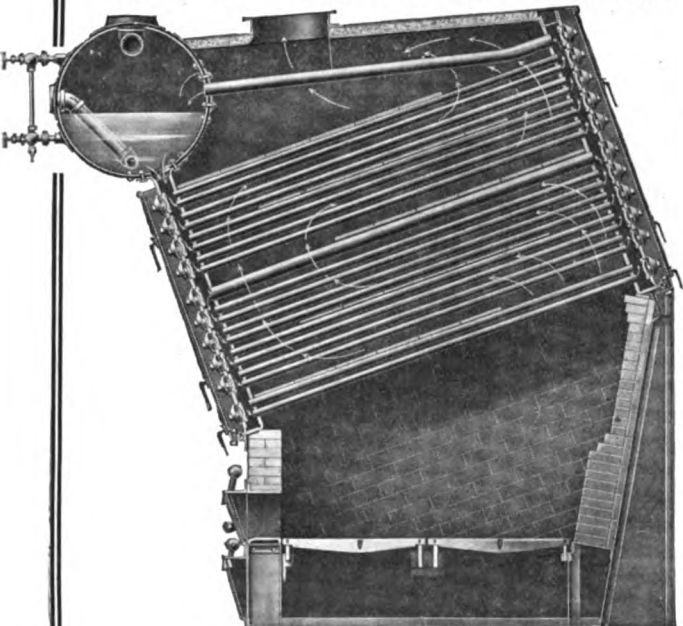


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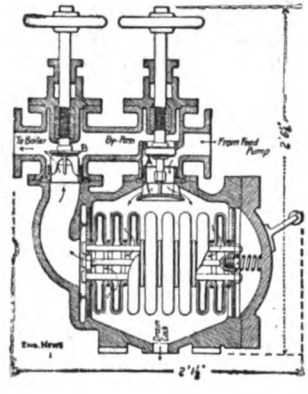


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GENERATING TUBES EXPANDED. NO OTHER
JOINTS. NO NIPPLE CONNECTIONS.
NO STAYBOLTS.

The Charles Ward Engineering Works
CHARLESTON, WEST VIRGINIA
MARINE ENGINES RIVER STEAMERS

**OUR
Feed-Water
Filters**



will keep oil out of
your boiler

They Have No Equal
Write for list of users

Ross Valve Mfg. Co.
Troy, N. Y.

**Ashton Highest Grade
POP SAFETY VALVES
AND STEAM GAGES**

Guaranteed to give Unequalled Efficiency, Durability
and Perfect Satisfaction

Special Features in Valves

Outside Pop Regulation, Cam Lever Attachment, Jessop Steel
Spring, Gages have Non-Corrosive Movements, Accurately
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THE ASHTON VALVE COMPANY

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Branches: New York Chicago Philadelphia San Francisco

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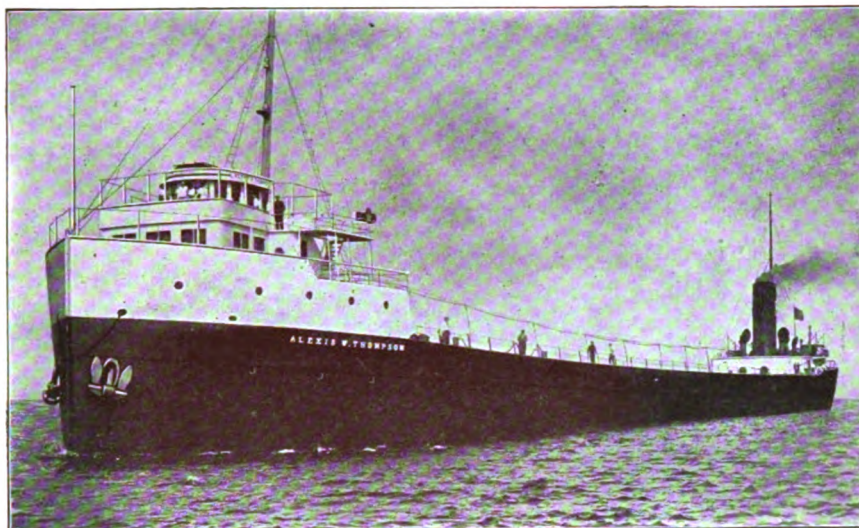
A 16% Saving in Fuel

That's what happened in the Valley Steamship Co.'s steamer
Alexis W. Thompson after boilers were equipped with

Eckliff Automatic Boiler Circulators

Fully protected by U. S. and foreign patents

"Watch
the
Thermometer"



"Watch
the
Thermometer"

THE BENEFITS OF PERFECT CIRCULATION

are so well known and so vitally important that to be without them is folly. Why not realize these benefits in your boilers? Why not get the proofs from us and then put in a trial Eckliff installation? Write today.

ECKLIFF AUTOMATIC BOILER CIRCULATOR CO.

DETROIT

54 Shelby Street

MICHIGAN, U. S. A. 217

FIRE TUBE MARINE SUPERHEATER

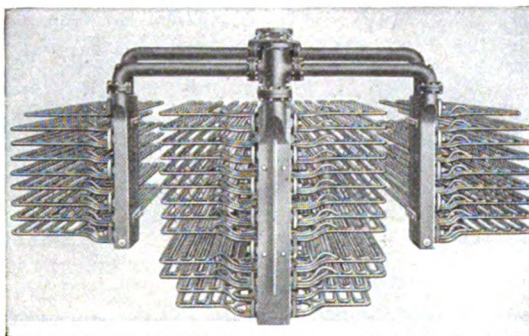
EIGHT REASONS WHY

1. It is adaptable to either new or existing boilers of the fire tube type and can be applied with no change in design or construction.

2. It renders possible an increase in output of boiler horse power from a given boiler plant, 10% to 20%.

3. It will produce the same power output with fewer boilers.

4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.

6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges and condensation in the cylinders.

7. It does not prevent rapid, thorough and frequent cleaning of the tubes.

8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, NEW YORK, N. Y.

Peoples Gas Bldg., CHICAGO, ILL.

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Real bargains in Passenger and Freight Boats, Dredges, Tugs, Dredging Machinery, Engines, Boilers, Cranes, and other opportunities are awaiting you

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don't think that it doesn't
pay to use or specify →

DIXON'S SILICA GRAPHITE PAINT

Think of what's saved in the labor cost of frequent repainting. For smokestacks, iron and steel hatches, steel masts, steel poles and other metal work. Color card No. 77-B upon request.

Made in Jersey City, N. J., by the

JOSEPH DIXON CRUCIBLE COMPANY

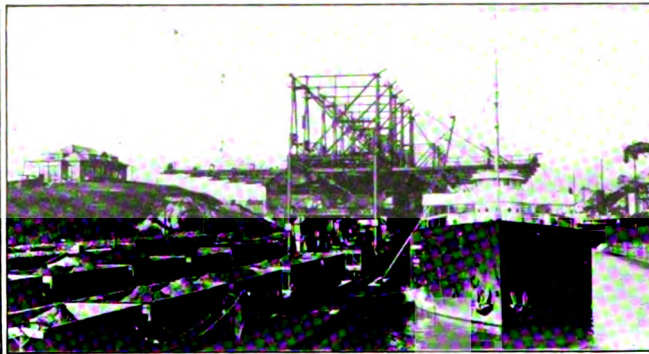
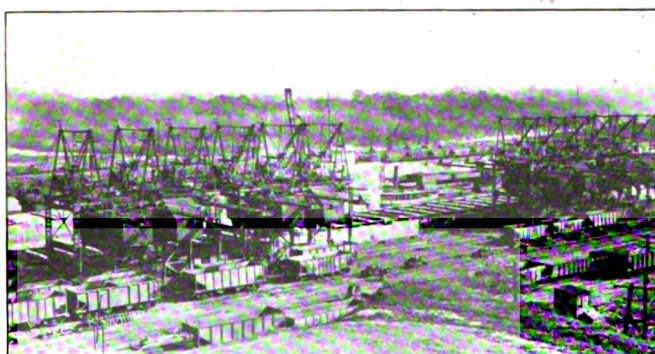


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For details and price, inquire

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Trade Mark Registered

BEST PAINT SOLD

For Every Part of Every Ship

B.P.S. paints are manufactured for particular vessel owners who wish a combination of protection, service, and economy.

The Patterson-Sargent Co.



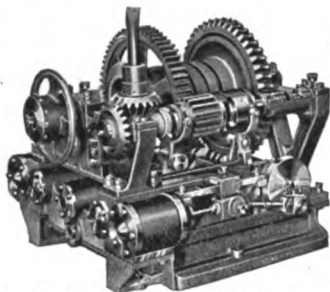
Cleveland Chicago New York



LIDGERWOOD

**STEERING
ENGINES
AND SHIP
WINCHES**

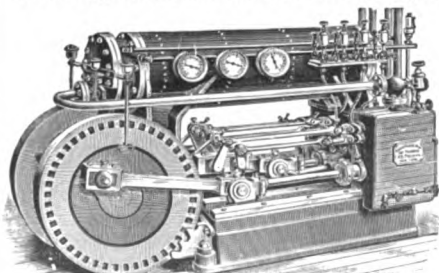
Built on duplicate part
system



LIDGERWOOD MFG. CO., 96 Liberty St., NEW YORK

The Allen Dense-Air Ice Machine

contains no chemicals. It is placed in the engine room, while the ice-making box and meat rooms are at distant places of the steamer.



Over two hundred in daily service in the tropics on men-of-war, steam yachts and mercantile steamers.

H. B. ROELKER, Designer and Manufacturer of Screw Propellers
41 Maiden Lane **NEW YORK**

The
McNab

**"CASCADE" BOILER CIRCULATOR
AND FUEL ECONOMIZER**

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SAVED SOME FUEL

Capt. W. C. Richardson of Cleveland reports:—"The Steamer 'David Z. Norton' in 1913 burned 4,600 tons of fuel. In 1914 she burned 3,600 tons or about 1,000 tons less in 1914 than in 1913. This shows that your Circulators saved the 'Norton' some fuel. The same applies to the Steamer 'L. B. Miller' and the Steamer 'C. R. Hubbard'. The boats did not run as many miles in 1914 as in 1913 but you can SAFELY say there was a saving of 600 tons on each vessel."

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TO NEGLECT THIS?**

Write at once

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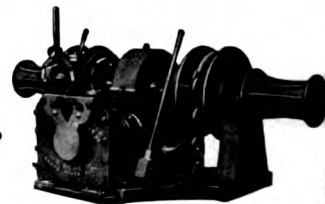


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WINDLASSES
MOORING HOISTS
DRILL HOISTS
SPUD HOISTS, ETC.**

Write for new catalog just out

Dake Engine Co.

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Low Pressure

REFRIGERATING MACHINES

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Office:

90 West Street - NEW YORK, N. Y.

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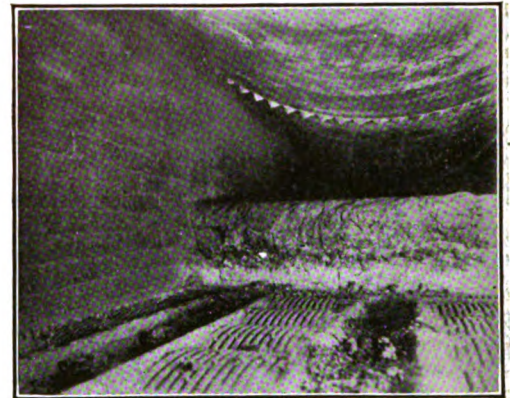
J-M PRODUCTS are not only the result of experience and expert workmanship on materials of the highest-grade, but have behind them the backing of J-M Service and Responsibility. They **MUST** give absolute satisfaction in service.

The use of J-M High Temperature Cement is justified by the fire-brick renewals it saves.

The real function of a fire-brick setting is to confine the heat of the fire to a certain, definite location.

Unfortunately, the material of which fire-brick is made, has no inherent strength to withstand the stress of contraction and expansion and must fail, through disintegration or spawling, where heating is excessive.

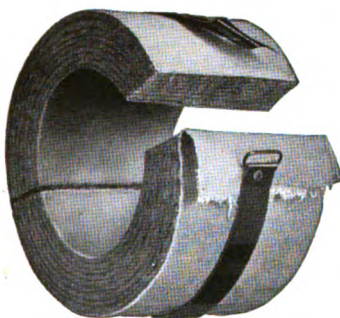
It is in correcting these well known, proven defects of fire-brick that **J-M Heat Treatment** saves money in lengthening the life of fire-brick settings. First, by protecting the fire-brick edges against the destructive effect of flames by using No. 31 High Temperature Cement as a bond between fire-brick courses. This cement vitrifies at a low furnace temperature and forms a solid wall of cement and fire-brick. Second, by painting the entire face of the new setting with J-M No. 32 High Temperature Cement all the natural pores, blisters and cracks in the brick are filled up, preventing disintegration caused by temperature variations. Your nearest J-M branch will furnish these cements for your next job.



Boiler furnace wall set with J-M No. 31 H. T. Cement in boiler-room of Christian Science Publishing Co., Boston. In continual use under stoker conditions for nearly a year and still good for an indefinite period.



There may be a hundred heat insulators that will cover your pipes—but only one that will insulate them.



J-M Asbesto-Sponge-Felted. One style of J-M Heat Insulation.

It is our business to investigate the problem of heat insulation in your plant and recommend the proper material. We can do this impartially, too, because of the variety of insulations we make and install.

There is another important feature covered by this service that should not be overlooked, and that is the proper application of the insulation.

Probably the best recommendation we can offer the engineer as to our efficiency in this line is to say that we maintain specialists all over the country, whose experience has been the broadest—and that our contract departments are made up of men who are experts in the application of various insulations.

Why not let us talk over your work with an idea of making the thermal efficiency of your plant a record breaker?

H. W. JOHNS-MANVILLE COMPANY

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THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED—Toronto Winnipeg Montreal Vancouver

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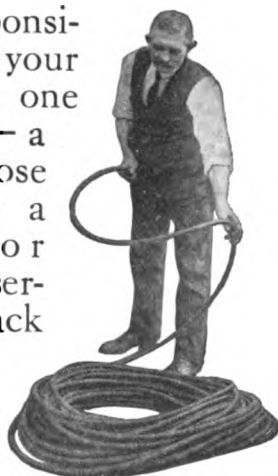
The Mark of Quality in Wire Rope

WATERBURY ROPE, whether it be Standard Wire Rope, Armored Wire Rope or Fibreclad Wire Rope, has proven its superiority in every marine service.

The Waterbury Company is the only manufacturer making every kind of rope used aboard a vessel—and can supply every rope need from stem to stern.

Put the responsibility for all your ropes up to one manufacturer—a company whose products have a reputation for quality and service dating back over one hundred years.

We will be pleased
to quote prices and
send catalogues.



Coiling Down
Fibreclad Wire Rope

WATERBURY COMPANY

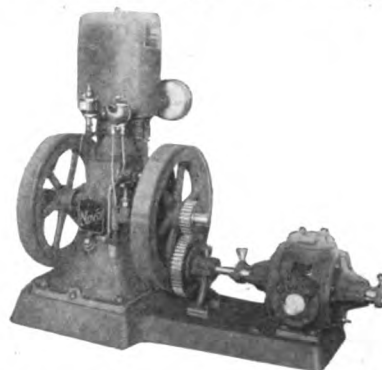
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CHICAGO
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SAN FRANCISCO
113 Davis Street
BOSTON
220 Franklin Street

DALLAS, TEXAS
Powell & Ellet Company
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NEW ORLEANS
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Can You Beat This With Your Bilge Pump?



By using Blackmer you have a pump for fighting fire and washing decks as well as bilge work.

We specialize in Bilge pumps and guarantee them to please you.

They are not an experiment as they have been in actual use for now upwards of nine years.

A letter from any of our customers will prove to you they are superior.

All pumps have but five working parts.

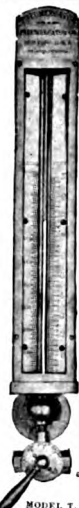
No springs.

Wear automatically taken up.

Priming not necessary.

BLACKMER ROTARY PUMP COMPANY

PETOSKEY, MICH.



MODEL T. I.

Mr. Chief Engineer:—

Last month we asked you to throw away your ballast tank sounding rods—Some of you are preparing to do so—*Have we heard from you?*

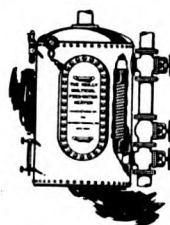
Pneumercator Company, Inc.

118 Liberty Street, New York

James C. H. Ferguson
Monadnock Building
San Francisco, Cal.

or
Alexander Hynd
872 Rockefeller Bldg.
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G. E. Lawrence
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Reilly Marine Specialties.

Reilly Multicoil Evaporators, Feed Water Heaters, Fuel Oil Heaters and Multiscreen Feed Water Filters and Grease Extractors are specially designed to meet the severe requirements of marine service. **WRITE FOR BULLETINS**

THE GRISCOM-RUSSELL COMPANY

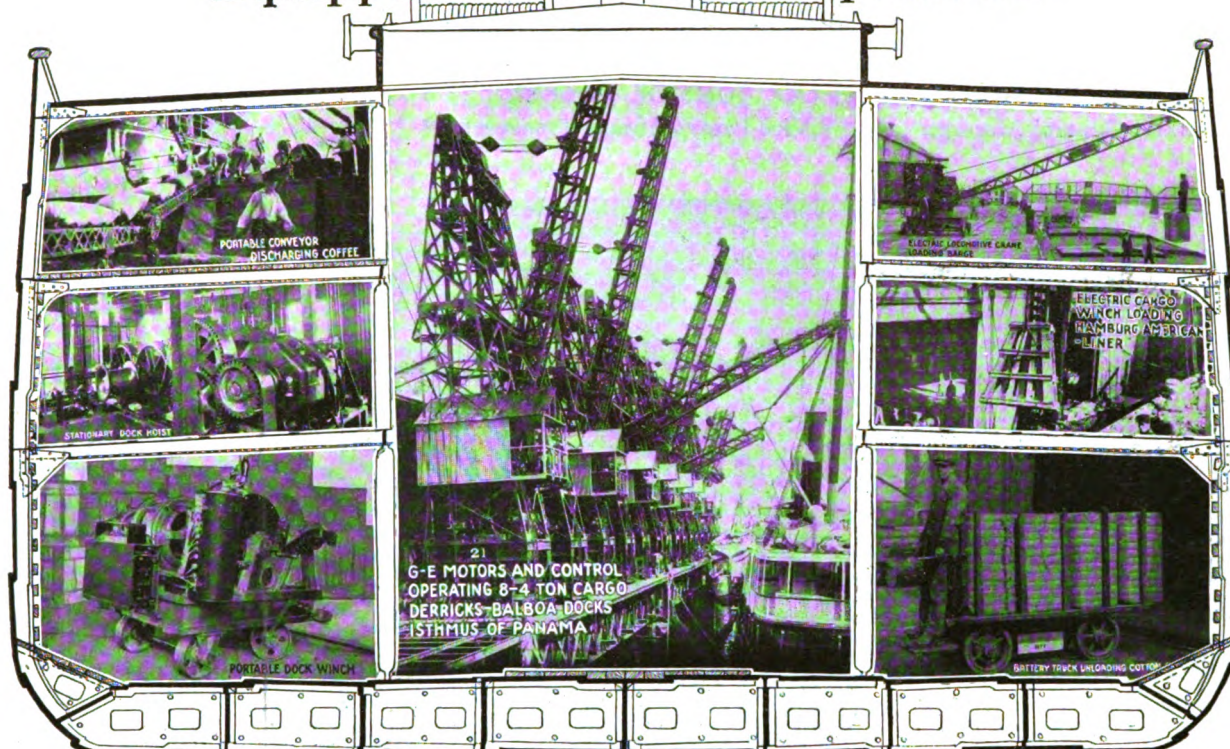
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Engineers—LAND AND MARINE—Manufacturers
2121 West St. Building, NEW YORK



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The General Electric Company is ready to help dock boards and city engineers increase the prestige of their ports by equipping any mechanical freight handling machinery they may select with electric motors and control equipment or to furnish the lamps for lighting the piers and bulkheads.

Many stevedoring firms, steamship companies and dock boards are greatly increasing dispatch and economy, while materially reducing accidents in their freight handling by the use of G-E equipment. Reductions in leakers result from the careful handling made easy by G-E control of movements. The greater cleanliness and dispatch obtains and holds for stevedoring firms the handling of packing house products and other profitable business.

Our engineers and salesmen have been following the electrical equipment of mechanical freight handling devices for years and can show remarkable results accomplished by equipment in use as well as many repeat orders resulting therefrom. We invite your investigation.

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Chicago, Ill.
Cincinnati, Ohio

Cleveland, Ohio
Columbus, Ohio
Dayton, Ohio
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New Haven, Conn.
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Richmond, Va.
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Salt Lake City, Utah
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Spokane, Wash.
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For Michigan Business refer to General Electric Company of Michigan, Detroit.
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Motor agencies in all large cities and towns

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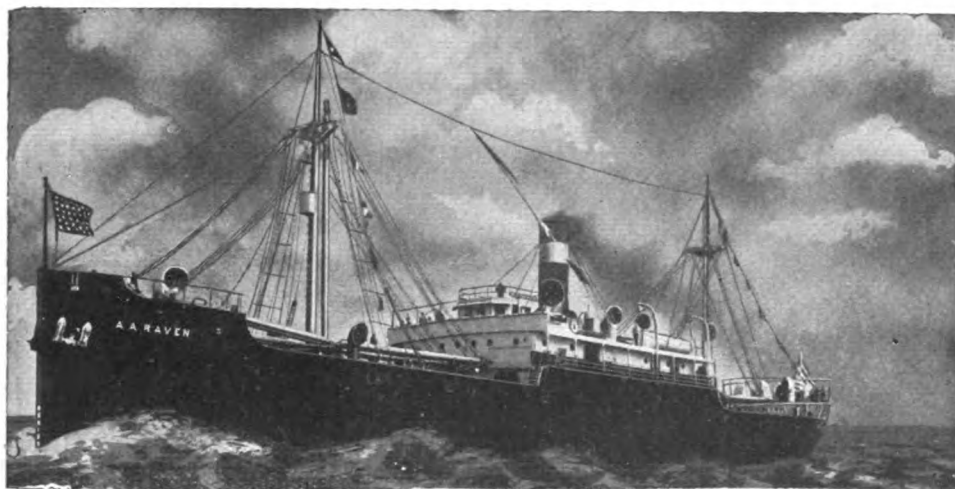
GREAT LAKES ENGINEERING WORKS

DETROIT, MICHIGAN

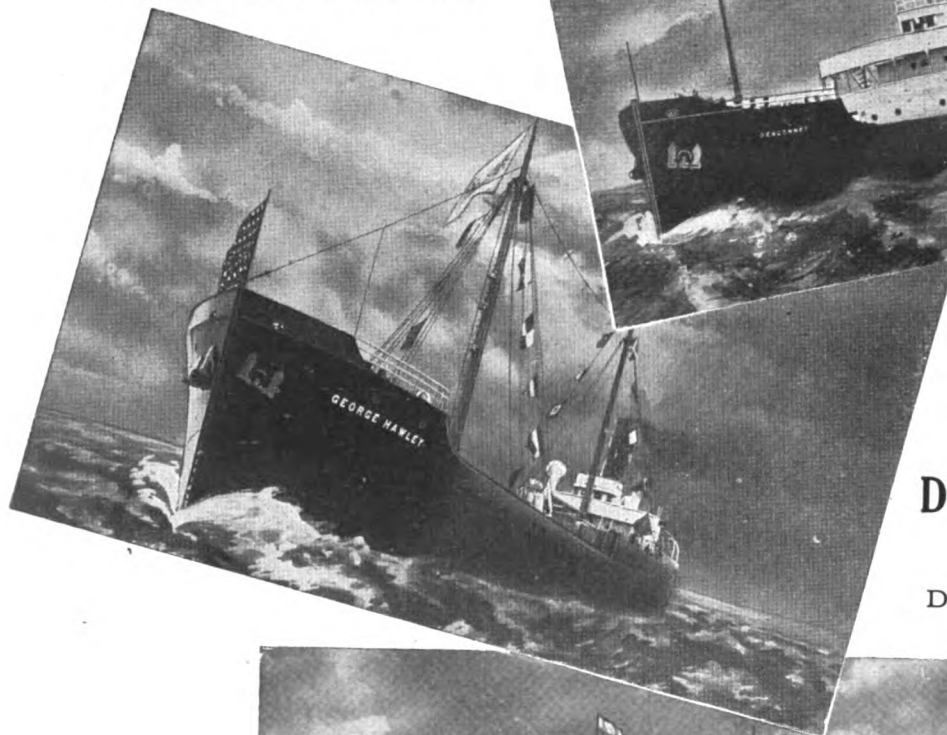
ANTONIO C. PESSANO
President and General Manager

JOHN R. RUSSEL
Vice President and Treasurer

H. W. HOYT
Vice President and Secretary



Four types of ships built by us
for Ocean and Coastwise service



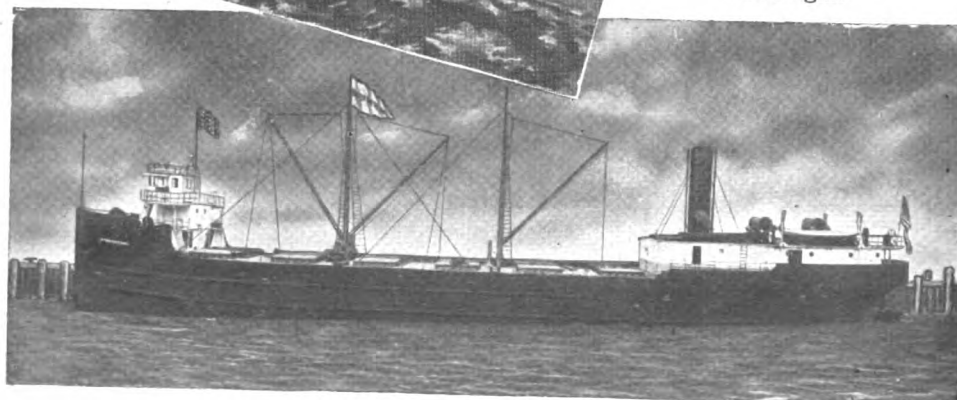
These vessels received certificates
of highest classification in British
Lloyds and the American Bureau of
Shipping

Ship Repairing
Dry Docks of Largest Capacity

Ship Yards and Engine Works
at

Detroit and Ecorse
Michigan

Ashtabula
Ohio



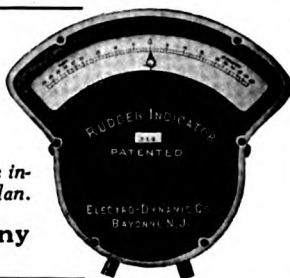
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The Electric Rudder or Helm Angle Indicator

Placed in pilot house or on bridge in front of quartermaster, allows him to observe the position of the rudder the same as he does the compass. *Can be installed on vessels with or without lighting plan.*



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**BOILERS, TANKS and PLATE WORK
OF ALL KINDS**

Federal Boiler Inspection Easily Taken Care of by Falls Hollow Stays



They eliminate drilling expenses and make unfailing tell-tales on fractured or broken stays. They possess double the endurance of Solid Stays, and are a proof without test against broken stays

FALLS HOLLOW STAYBOLT CO.

CUYAHOGA FALLS.

OHIO, U. S. A.

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Brass Founders	Machinists	Galvanizers
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JERSEY CITY and EVERYWHERE

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BINNACLE

RITCHIE

**Compasses,
Binnacles.**

and NAUTICAL Instruments

SOLD IN ALL PARTS
OF THE WORLD

Magnets for Adjusting Purposes.

E. S. RITCHIE & SONS
BROOKLINE - MASS.

Put This Down
If FUEL COAL is
needed on the
St. Lawrence River



HALL'S COAL
HALL'S SERVICE
HALL'S PRICE

BEATS 'EM ALL
MONTREAL, P. Q. OGDENSBURG, N. Y.

THE MULHOLLAND HATCH-FASTENER COMPANY
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Manufacturers of the Mulholland Simplex and
Security Hatch Fasteners. For Ocean and
Lake Trade.

OVER 225,000 SETS NOW IN USE ON THE GREAT LAKES

THE CHASE MACHINE CO.

ENGINEERS AND MACHINISTS

*Mooring Machines, Deck Winches,
Steam Capstans, Etc., Etc.*

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SHERIFFS
MANUFACTURING CO.

Manufacturers of
**PROPELLER
WHEELS**
Marine Engines
and Repairs.

MILWAUKEE, WIS.
Phone S. 163

H. G. Trout Company
King Iron Works
BUFFALO, N. Y.

Manufacturers of High Grade
PROPELLER WHEELS

Marine Engines
Brass and Iron Casting
Large variety of Grate Bars
in stock

Write for particulars and testimonials.



GREAT LAKES DREDGE & DOCK CO.
MANUFACTURERS OF
REINFORCED CONCRETE PILES
for detail see previous issues of this Paper
HOME OFFICE IN CHICAGO
CONCRETE PILE DEPARTMENT IN CLEVELAND

MARINE BOOKS

We have just issued a new book catalog listing
and describing in detail all the recognized books on
marine subjects. A copy is yours for the asking.

Penton's Book News, Cleveland, Ohio

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Remittance should accompany order for one-time ads.

IMPORTANT

Seven (7) words must be allowed for box address.
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Clarence L. Parker, Vessel Agent,
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Sells and Buys Boats of every class and type.

FOR SALE ON EASY TERMS OR WILL trade Tug Cadillac, perfect condition, allowed 125 lbs. steam. Charles Ryan, 4 Birge Bldg., Buffalo, N. Y.

IRON HULL 167 x 26 FT., FROM burned steamer Arundel, can be rebuilt at saving of about \$15,000. Can be seen at Manistee. Pere Marquette Line Steamers, Manistee, Mich.

FOR SALE:—LOCOMOTIVE CRANES, McMyler revolving derricks, with clam shells. The Cleveland & Erie Machinery Co., Rockefeller Bldg., Cleveland, O.

FOR SALE:—TWO SCOTCH MARINE boilers, 10 feet diameter and 11 feet long, allowed 140 pounds pressure. New—never been used. Address Johnston Brothers, Ferryburg, Mich.

THE OWNER OF THE CHOICE MIL-waukee built, 300 ft. freight steamer Thomas Davidson (3,500 tons coal) retiring management now offers her for sale. Also the barge Baltic, about seventy thousand corn or wheat; twelve hundred thousand lumber capacity; large repairs recently. Towing machine, new cable, pumps, etc. Best offer takes them. H. J. Pauly, 165 Eighteenth St., Milwaukee, Wis.

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FOR SALE:—TWO SCOTCH MARINE boilers. Now on the dock of the Great Lakes Engineering Works, at Ecorse. These boilers are about 13 feet diameter and length and were allowed 125 lbs. steam when last inspected. Write O. W. Blodgett, Duluth, Minn.

FOR SALE:—TUG RUNNELS, 58.9 x 15.3 ft. depth 6.9, draws 8 ft. of water. Gross tonnage 37.87, net 18. 16 sq. high pressure engine. Boiler about 120 lb. Dorr E. Warner, Atty., Cleveland, O.

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FOR SALE:—MOTOR BOAT HANDY-bow, 4 ft. x 11 ft. x 45 ft., steel hull, trunk cabin, first class boat for delivery and carrying passengers. In first class condition. Has 30 H. P. Buffalo engine, 4 cylinder. 1041 Niagara St., Buffalo, N. Y.

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PLANT FOR SALE:—ONE THREE cubic yard dipper dredge; 1 Tug Boat, 13 x 15 cylinder, hull 40 feet x 13 feet x 6 feet; 3 derrick scows; 1 flat scow 76 feet x 24 feet x 7 feet 6 inches; 2 three hundred cubic yard mud scows; one 1½ yard orange peel bucket; one 1¼ yard Williams clam shell bucket; one direct connected ¼ cubic yard concrete mixer; one marine lake type boiler 16 feet long, 9 feet in diameter, built for 145 pounds working pressure, heating surface 2,400 square feet. Great Lakes Construction Co., 1117 Chamber of Commerce building, Buffalo, N. Y.

FOR SALE FOR CASH — SMALL Steamer in good condition. Gross tons, 43; net tons, 33; length, 56 ft. 4 in.; breadth, 30 ft. 2 in.; depth, 3 ft. 8 in.; boiler, 8 ft. 6 in. x 52 in. Steel, built in 1907; steam allowed, 100 lb. Engine, 10½ in. diameter x 12-in. stroke non condensing. Draft light, 6 ft.; loaded, 6 ft. 6 in. to 7 ft. Capacity 50M to 60M of hardwood; 60M to 80M of soft wood. Is fitted with steam hoist of 3 to 4 tons capacity. Is now in commission but arrangements can be made in advance if parties wish to look her over with view to buying. For further information and price write or call on W. E. HOLMES & CO., 1049 Insurance Exchange, Chicago, Ill.

FOR SALE CHEAP—STR. F. R. BUELL. Length, 194 ft.; beam, 35 ft. 5 in.; depth, 13 ft. 9 in. Carries lumber cargo 900,000 ft. Coal, 1,250 tons. Inquire A. Weston & Son, N. Tonawanda, N. Y.

FOR SALE CHEAP—BGE. A. STEWART. Length, 172 ft.; beam, 32 ft. 4 in.; depth, 12 ft. 1 in. Carries lumber cargo 750,000 ft. Coal, 1,000 tons. Boats have kept up in good condition. Inquire A. Weston & Son, N. Tonawanda, N. Y.

FOR SALE:—STEAM SAND SUCKER, fully equipped; capacity 180 yards, length 117 feet, beam 23 feet; draft, light 7 feet, loaded 10 feet; at a bargain price if taken at once. Address Box 94, THE MARINE REVIEW, Cleveland, O.

FOR SALE—LUMBER BARGE ALBERT Soper. Rating 90 C. F., capacity 300,000 hardwood, 425,000 pine; boiler pressure 150 lbs.; good economical boat; hull in first class condition throughout. Also tow barge Halstead, capacity 750,000 lumber; recently extensively rebuilt. Both boats now at Green Bay. Apply Greiling Bros. Co., Green Bay, Wis.

FOR SALE VESSEL PROPERTY. FINE tow barge. Light draft. Has grain class. Capacity One Million feet. Steam windlass, steam hoisters. Too small for owners use.

Wooden steamer, carries 3,200 tons, 110,000 bushels corn. Self trimmer. Triple expansion engine. Electric lights, two cable machines. Stockless andirons. Towing machine. Boiler and hull rebuilt 1914. Very economical boat to operate. Now running in grain trade.

Wooden tow barge, 309 x 44 x 12 feet. Gunwale built. Molded bow. Carries load all on deck. Steam windlass. Cable machine. Masts, classes 80CF. Enquire owner. Address Box 106, THE MARINE REVIEW, Cleveland, Ohio.

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TUG ENGINE — 12-INCH x 12-INCH high pressure, for sale. Built by the Bay State Iron Works, Erie, Pa. Whitman Machine Co., 178 Ohio St., Buffalo, N. Y.

LARGE TUG FOR SALE, 73 FT. x 17 ft. x 10 ft. in size with semi-Scotch marine boiler, allowed 140 pounds of steam, steam steerer, etc., entirely rebuilt last year, operating and in first-class condition, price for quick sale, \$7,500.

ALSO SCOW, 185 x 35 FT. x 10 FT. capacity 800 yards sand or gravel. Last year had installed modern 12-inch Morris centrifugal sand pumping outfit with large marine boilers, mooring engines and ballast pump, etc. This vessel built 1904 at cost of \$43,000. Price for quick sale \$12,000. Might consider trade for good real estate. Address W. C. Farrington, 316 Moffat building, Detroit, Mich.

FOR SALE CHEAP:—ONE WILLIAM-son Bros. combined hand and steam steerer with stand and valve operating levers. Size of cylinders 6 in. x 6 in. In perfect condition. Price \$300 each. Cost price \$1,200. Address Jerry McCarthy & Sons, 157 Ohio St., Buffalo, N. Y.

TWO PRETTY PASSENGER STEAM-boats Bristol and Gardiner, 150 and 170 passengers respectively; 10 ft. x 18 ft. Fully equipped and in perfect running order. No reasonable offer refused. Getting too small for our business. ISLAND BEACH CORP., Greenwich, Conn.

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Wanted

WANTED:—A GOOD SECOND-HAND marine engine and boilers. Or engine alone for a 4,000-ton boat. Give particulars. Address Box 107, THE MARINE REVIEW, Cleveland, Ohio.

WANTED: — BOAT 45-65 x 12-15 FT. With or without power. Must be heavily constructed. Must be bargain. Full description in first letter. B. Iwema, 1162 N. Branch St., Chicago, Ill.

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I HAVE FLOATING PROPERTY OF most all kinds and sizes to sell. Anybody wanting to buy or sell boats should call on or write Frederick A. Bradley, 217 Franklin St., Buffalo, N. Y. Bell Phone Tupper, 1379.

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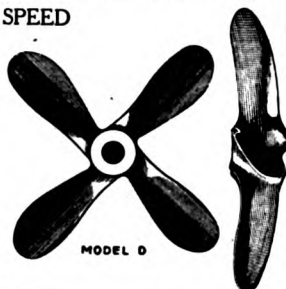
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It is now made in sections of any desired length. The sections can be instantly connected by means of snap hooks, adapting the ladder to light or loaded conditions of ships and eliminating the telescopic feature of the former type.

The cable is of plow steel combining lightness with great strength; the steps stamped sheet metal with two-tooth prongs giving a firm foothold; hooks bronze and rivets copper.

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"We beg to advise that the Jacob's Ladder furnished the steamer Castalia during season 1913 has proven very satisfactory indeed. The master, Capt. W. L. Girardin, reports that these ladders should be installed on all the boats as they are very efficient and much safer than the old style roper ladder."

The Brown Steamship Company, Cleveland.

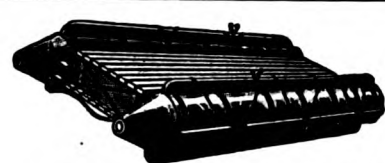
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The McArthur Jacob's Ladder is patented and all infringements upon it will be prosecuted

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Outfits for Lake Steamers a Specialty

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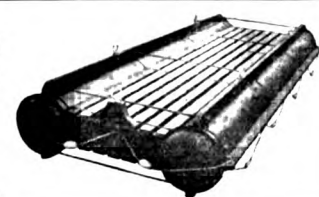
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 Famous for their QUALITY and ECONOMY
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Collingwood Ship Building Co.
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Detroit Ship Building Co.
Fore River Ship Building Corp.
Goldschmidt Thermit Co.
Great Lakes Engineering Works
Johnston Bros.
Kennedy Valve Mfg. Co.
Manitowoc Ship Bldg. & Dry Dock Co.
Milwaukee Dry Dock Co.
St. Lawrence Marine Ry. Co.
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- SHERIFFS MFG. CO.**
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- ROPE.**
Durable Wire Rope Co.
- ROPE.—(Wire, Manila & Fibre-clad.)**
Waterbury Co.
- ROPE AND FITTINGS.**
Durable Wire Rope Co.
- ROPE DRESSING.**
Dixon, Joseph, Crucible Co.
- ROPE DRIVES.**
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- SEARCHLIGHTS.**
General Electric Co.
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- SHEAVES.**
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- SHIPS.—(Builders of.)**
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AMERICAN LINE

The Only Trans-Atlantic Steamers Under
the American Flag

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Sailing from New York
Every Saturday
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(11,629 tons)

St. Paul
(11,629 tons)

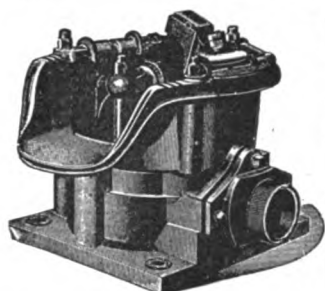
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(10,798 tons)

Philadelphia
(10,786 tons)

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**Pier 62, North River, Foot of West 23rd St.,
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No. 1811.

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ABSOLUTELY FIREPROOF

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200 " " " 2.00 " 3.00 " "
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Gunn, P. J.
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Furstenau, M. C.
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General Electric Co.

TANKS.
Bath Iron Works

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The Great Lakes Red Book is a complete directory of the vessels and vessel owners of the Great Lakes.

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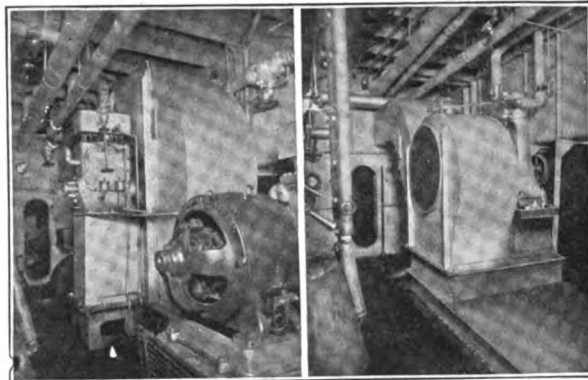
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Boiler Works

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NEWBURGH, N. Y.

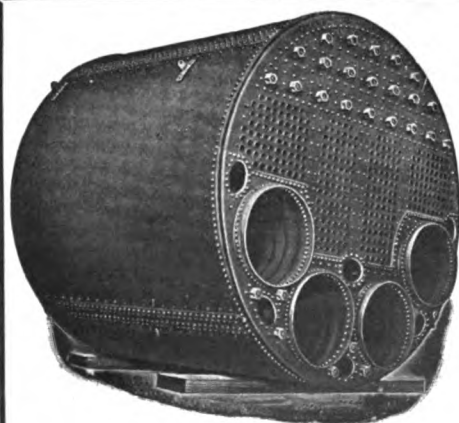
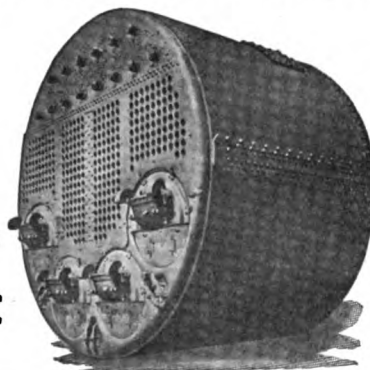
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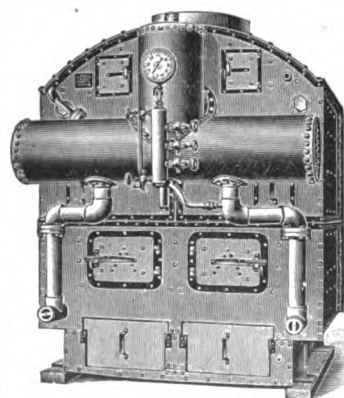


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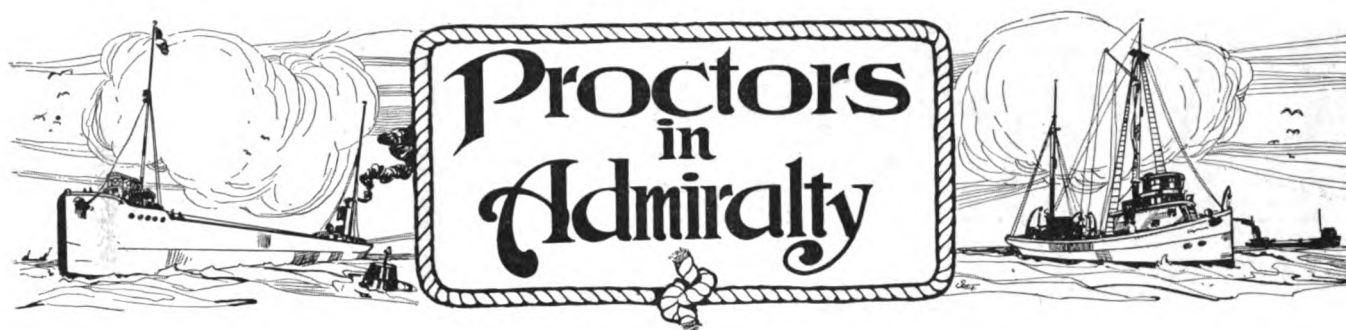
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Do you want to be the representative sanitary supply house for marine trade in your port? If you do, your advertisement on this page will enable you to occupy that position providing the publicity thus gained is backed by the proper conduct of your business.

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Cleveland, Ohio

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Bound with flexible paper cover, pocket size, postpaid any-
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A most useful directory. Compiled and published by

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The very men in the marine field—the actual boat owners and operators—
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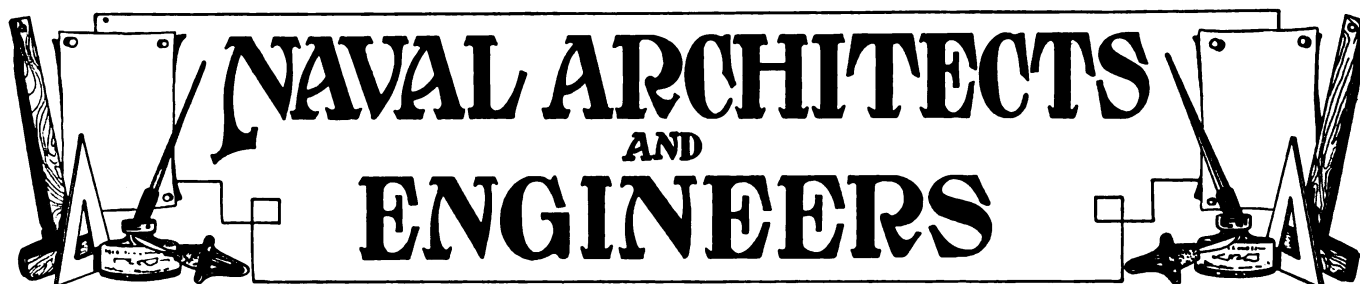
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THE MARINE REVIEW

Cleveland, Ohio

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Railways, Terminals, Harbors, Docks, Warehouses, Industrial
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THE MARINE REVIEW

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Cleveland, Ohio

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Vessel Fuel Coal of the best quality
always available at all Lake Erie Ports.
Prompt and satisfactory service guaran-
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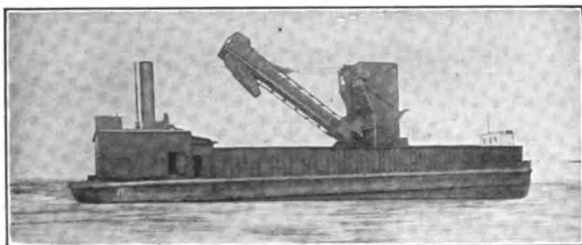
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M.A. HANNA & Co.

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Lighter "West Shore," Buffalo, N. Y.
Capacity 500 Tons per hour

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Pittsburgh coal furnished at any time
during day or night.

Western Reserve Building
CLEVELAND, O.

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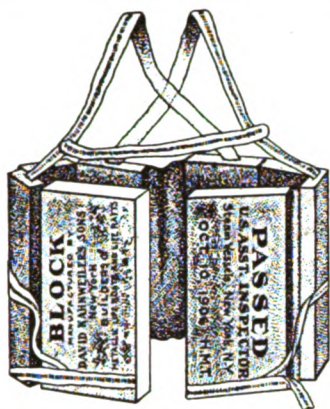
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Docks and Fuel Lighter

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Solid Block Cork Life Preservers

Warranted 24 pounds. Buoyancy and full weight of Cork and Workmanship as required by U. S. Inspectors.

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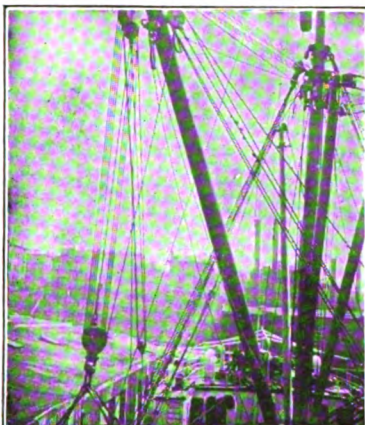
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Durable Wire Rope will Not Rust or Rot and is not affected by Salt Water or Climatic Conditions

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Patented in Canada Sept. 4, 1906.

This Gear consists of a line shaft placed below the chain rollers, and requires a coaming at least 15 inches high.

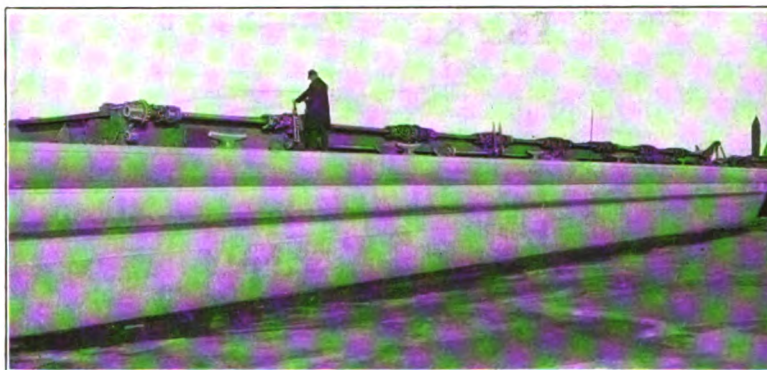
The shaft is given an oscillating motion by means of a small engine placed in the hold of the scow, steam being supplied by a steam hose from the tug or dredge.

Motion is communicated to the chain rollers by winding dogs held up to the ratchets by the attendant, and two pockets can be wound at the same time by one man.

With this gear the largest scow can be wound up in a few minutes with very little labor and with a large saving of time as compared with hand winding.

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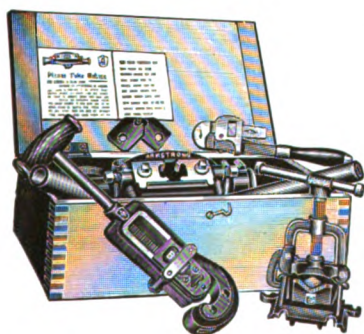
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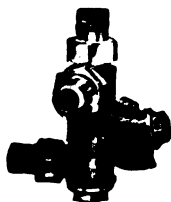
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